

RFID System

V680 Series

User's Manual

FL Remote ID

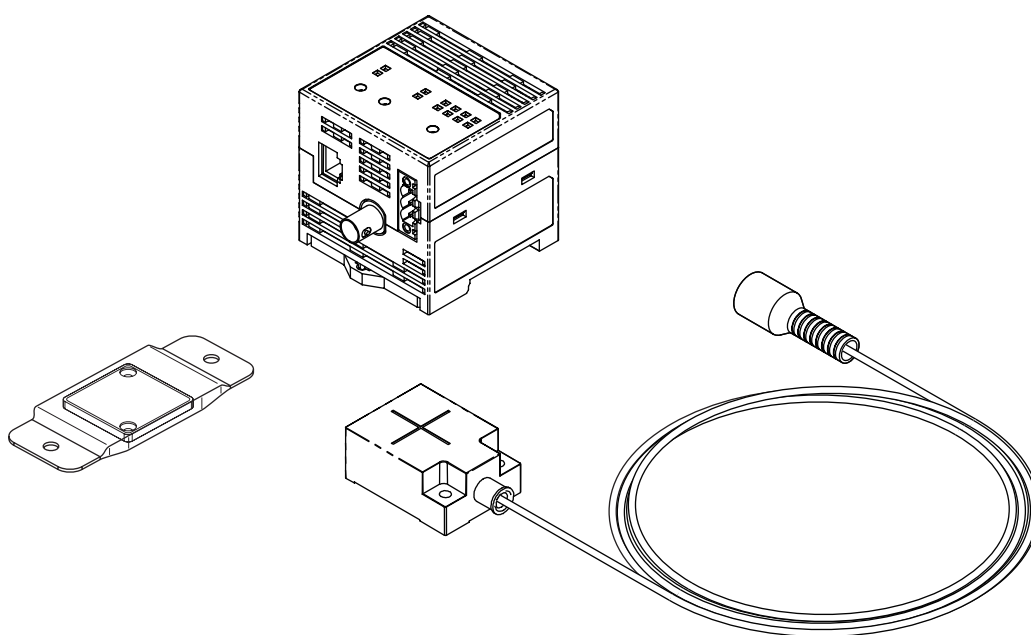
V680-HAM42-FRT

Antenna

V680-HS63-SP

ID Tag

V680-D1KP66T-SP



Introduction

Thank you for purchasing a V680-series RFID System. This manual describes the functions, performance, and application methods needed for optimum use of the V680-series RFID System.

Please observe the following items when using the RFID System.

- Allow the RFID System to be installed and operated only by qualified specialist with a sufficient knowledge of electrical systems.
- Read and understand this manual before attempting to use the RFID System and use the RFID System correctly.
- Keep this manual in a safe and accessible location so that it is available for reference when required.

Introduction	READ AND UNDERSTAND THIS DOCUMENT	Introduction
SECTION 1	Product Overview	SECTION 1
SECTION 2	Installation, Connections, and Wiring	SECTION 2
SECTION 3	Preparations for Communications	SECTION 3
SECTION 4	Functions	SECTION 4
SECTION 5	Communications	SECTION 5
SECTION 6	Troubleshooting	SECTION 6
SECTION 7	Appendices	SECTION 7

RFID System

V680-HAM42-FRT
V680-HS63-SP
V680-D1KP66T-SP

FL Remote ID
Antenna
ID Tag

User's Manual

READ AND UNDERSTAND THIS DOCUMENT

Please read and understand this document before using the products. Please consult your OMRON representative if you have any questions or comments.

WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

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OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

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THE PRODUCTS CONTAINED IN THIS DOCUMENT ARE NOT SAFETY RATED. THEY ARE NOT DESIGNED OR RATED FOR ENSURING SAFETY OF PERSONS, AND SHOULD NOT BE RELIED UPON AS A SAFETY COMPONENT OR PROTECTIVE DEVICE FOR SUCH PURPOSES. Please refer to separate catalogs for OMRON's safety rated products.

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the product.

At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

PERFORMANCE DATA

Performance data given in this document is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons.

It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the product may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

ERRORS AND OMISSIONS

The information in this document has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.

PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

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Safety Precautions

● Alert Symbols for Safe Use

The following symbols are used in this manual to indicate precautions that must be observed to ensure safe use of the V680-HAM42-FRT/V680-HS63-SP/V680-D1KP66T-SP. The precautions provided here contain important safety information. Be sure to observe these precautions.

The following signal words are used in this manual.



Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally, there may be significant property damage.

● Meanings of Alert Symbols



Indicates general prohibitions for which there is no specific symbol.

● Warning



This Product is not designed to be used either directly or indirectly in applications that detect human presence for the purpose of maintaining safety. Do not use this Product as a sensing device for protecting human lives.



Regulations and Standards

The V680-HAM42-FRT conforms to the following overseas regulations and standards.

1. U.S.A., Canada

U.S.A.: FCC Rules (Federal Communications Commission)

Canada: IC Rules (Industry Canada)

FCC Part15 subpart C, RSS-Gen

FCC ID: E4E6CYSIDV6800507

IC: 850J-V6800507

This device complies with part 15 of the FCC Rules and RSS-Gen of IC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

FCC Part15 subpart B

NOTICE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

ICES-003

This class A digital apparatus complies with Canadian ICES-003.

WARNING

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Do not remove the ferrite core (TDK Type ZCAT1525-0430AP) installed on the cables to suppress RF interference. And attach the accompanying ferrite core (TDK Type ZCAT2032-0930) around the cables that are connected with the power and grounding terminals.

UL508



Use the V680-HAM42-FRT connected to the following circuit 1 or 2.

Circuit 1:

A circuit with a restricted voltage and current as certified by UL508. Use a circuit that uses the windings of the secondary side of an insulating transformer that satisfies the following two conditions as the power supply:

- Maximum voltage with no load: 30 Vrms, 42.4 V peak

- Maximum current:
 - a) 8 A (including short-circuit current) or
 - b) A current restricted by a fuse or other circuit protector with the ratings in the following table:

No-load voltage (V peak)	Maximum rated current (A)
0 to 20	5.0
More than 20 to 30	$\frac{100}{\text{Peak voltage}}$

Circuit 2:

A Class 2 circuit, i.e., a circuit with a maximum voltage of 30 Vrms (42.4 V peak) that uses a Class 2 power supply unit compliant with UL1310 or a Class 2 transformer compliant with UL1585 as the power supply.

2. Europe

EC-R&TTE (Radio and Telecommunications Terminal Equipment Directive 1999/5/EC)

Radio: EN 300 330

EMC: EN 301 489

Safety: EN 61010-1



English	Hereby, Omron, declares that the RFID System, V680-HS63-SP Series, and V680-HAM42-FRT Series are in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Finnish	Omron vakuuttaa täten että RFID Säännös, V680-HS63-SP Series, V680-HAM42-FRT Series tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Dutch	Hierbij verklaart Omron dat het toestel de RFID Systeem, V680-HS63-SP 'Serie, V680-HAM42-FRT 'Serie in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
French	Par la présente Omron déclare que la RFID Système, V680-HS63-SP Série, V680-HAM42-FRT Série sont conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Swedish	Härmed intygar Omron att den RFID System, V680-HS63-SP Serie, V680-HAM42-FRT Serie står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.
Danish	Undertegnede Omron erklærer herved, at følgende den RFID System, V680-HS63-SP Serie, 680-HAM42-FRT Serie overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
German	Hiermit erkläre Omron, die RFID System, V680-HS63-SP Serie, V680-HAM42-FRT Serie in Übereinstimmung mit den grundlegenden Anforderungen und den anderen relevanten Vorschriften der Richtlinie 1999/5/EG befindet. (BMW)
Greek	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ Omron ΔΗΛΩΝΕΙ RFID ΟΥΟΓΗΜΑ, V680-HS63-SP ΟΕΙΡΑ, V680-HAM42-FRT ΟΕΙΡΑ SYMMOPF ONETAI ΠΙΠΟS TIS ΟΥSΙΟΔΕΙS ΑΠΑΙΤΗΣΕΙS ΚΑΙ TIS ΛΟΙΠΕS ΣΧΕΤΙΚΕS ΔΙΑΤΑΞΕΙS ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
Italian	Con la presente Omron dichiara che la RFID Sistema, V680-HS63-SP Serie, V680-HAM42-FRT Serie sono conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Spanish	Por medio de la presente Omron declara que el RFID Sistema, V680-HS63-SP Serie, V680-HAM42-FRT Serie esta conforme a los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
Portuguese	Omron declara que a RFID Sistema, V680-HS63-SP Série, V680-HAM42-FRT Série ser conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Romanian	Prin prezenta, Omron declară că acest V680-HS63-SP, V680-HAM42-FRT este conform cu cerințele principale și cu celelalte prevederi relevante ale Directivei 1999/5/EC.

Note the following points in using the RFID System:

- Do not remove the ferrite core (TDK Type ZCAT1525-0430AP) from the Antenna Cable because it is necessary for suppressing signal interference. Also, be sure to attach the ferrite core (TDK Type ZCAT2032-0930) that comes as an accessory with the V680-HAM42-FRT to the cable that is connected to the power supply terminal and ground terminal.

3. Japan Radio Law

Equipment using high frequencies: Inductive Reading/Writing Communications Equipment

Conforming standards: Inductive Reading/Writing Communications Equipment; Standard: ARIB STD-T82;

Specification number: EC-07022

4. China

	Antenna
CMII ID: 2008DJ0145	V680-HS63-SP

1. 本产品的使用方法等请参见产品说明书。本产品的技术参数如下:

■使用频率为: 13.553~13.567MHz

■所发射的电场强度在距设备10米处不得超过42dB μ A/m(采用准峰值检波);

■频率容限: $\leq 100 \times 10^{-6}$

■杂散辐射等其他技术指标请参照2005/423号文件

2. 使用者不得擅自更改发射频率、加大发射功率(包括额外加装射频功率放大器), 不得擅自外接天线或改用其它发射天线;

3. 使用时应注意不得对各种合法的无线电通信业务产生有害干扰; 一旦发现有干扰现象时, 应立即停止使用, 并采取措施消除干扰后方可继续使用;

4. 本产品为微功率无线电设备, 能够承受各种无线电业务的干扰或工业、科学及医疗应用设备的辐射干扰;

5. 本产品不得在飞机和机场附近使用。

Precautions for Safe Use

Be sure to observe the following precautions to ensure safe use of the Products.

1. Do not use the Products in environments with flammable, explosive, or corrosive gasses.
2. Do not attempt to disassemble, repair, or modify any Product.
3. Tighten mounting screws securely.
4. Be sure to use crimp terminals of the specified size for wiring.
5. If any cable has a locking mechanism, make sure that it has been locked before using the cable.
6. Make sure the power supplied by the DC power supply unit is within the rated power supply voltage (24 VDC +10%/–15%) before using the Product.
7. Do not connect the power supply in reverse.
8. Do not allow water or pieces of wire to enter from openings in the case. Doing so may cause fire or electric shock.
9. Turn OFF the FL Remote ID power before attaching or removing the Read/Write Antenna.
10. If an error is detected in any Product, immediately stop operation and turn OFF the power supply.
Consult with an OMRON representative.
11. Dispose of the Products as industrial waste.
12. Do not touch the product immediately after usage at high temperatures. Doing so may occasionally result in burning.
13. If multiple Antennas are mounted near each other, communications performance may decrease due to mutual interference. Refer to *Mutual Interference between Antennas (Reference)* and check to make sure there is no mutual interference.
14. Provide sufficient ventilation space.
15. Do not install the Products near any equipment that generates a large amount of heat (such as heaters, transformers, and large-capacity resistors).
16. Do not clean the Products with paint thinner, benzene, acetone, or kerosene.
17. Observe all warnings and precautions given in the body of this manual.

Precautions for Correct Use

Always observe the following precautions to prevent operation failures, malfunctions, and adverse effects on performance and equipment.

1. Installation Environment

Do not use the Products in the following locations.

- Locations exposed to corrosive gases, dust, metallic powder, or salts
- Locations not within the specified operating temperature range
- Locations subject to rapid changes in temperature or condensation
- Locations not within the specified humidity range
- Locations subject to direct vibration or shock outside the specified ranges
- Locations subject to spray of water, oil, or chemicals

2. Installation

- The Products communicate with Tags using the 13.56-MHz frequency band. Some motors, inverters, and switching power supplies generate noise that can affect communications with the Tags and cause errors. If such devices are located near the Tags, always test operation in advance to confirm whether the system will be affected.
- Observe the following precautions to minimize the effects of normal noise.
 - (1) Ground all metal objects in the vicinity of the Products to 100 Ω or less.
 - (2) Do not use the Products near high-voltage or high-current lines.
- When mounting the Products, tighten the screws to the following torques.
 - V680-HS63-SP: 1.2 N·m
 - V680-D1KP66T-SP: 1.2 N·m

3. Storage

Do not store the Products in the following locations.

- Locations exposed to corrosive gases, dust, metallic powder, or salts
- Locations not within the specified storage temperature range
- Locations subject to rapid changes in temperature or condensation
- Locations not within the specified storage humidity range
- Locations subject to direct vibration or shock outside the specified ranges
- Locations subject to spray of water, oil, or chemicals

Meanings of Symbols



CHECK!

Indicates particularly important points related to a function, including precautions and application advice.



Indicates page numbers containing relevant information.



Indicates reference to helpful information and explanations for difficult terminology.

TABLE OF CONTENTS

Introduction

READ AND UNDERSTAND THIS DOCUMENT	2
Safety Precautions	3
Regulations and Standards	4
Precautions for Safe Use	8
Precautions for Correct Use	9
Meanings of Symbols	10
TABLE OF CONTENTS	11

SECTION 1 Product Overview 13

Features	14
Part Names and Functions	16
System Configuration	21
Application Flowchart	22

SECTION 2 Installation, Connections, and Wiring 23

FL Remote ID	24
Installing Antennas	29
Installing ID Tags	31

SECTION 3 Preparations for Communications 33

Parameter Settings for FL Remote Communications	34
---	----

SECTION 4 Functions 37

Communications Specifications	38
Write Protection	41
Noise Measurement	44
ID Tag Service Life Warning Management	45

SECTION 5 Communications	51
I/O Specifications	52
Detailed Command Settings	55
Timing Charts	59
SECTION 6 Troubleshooting	63
Handling Errors	64
Errors and Countermeasures	66
Maintenance and Inspection	67
SECTION 7 Appendices	69
Specifications and Dimensions	70
Characteristics According to Operating Conditions	76
Tag Memory Map	78
Tag Memory Capacity and Memory Type	79
Degree of Protection	80
Revision History	82

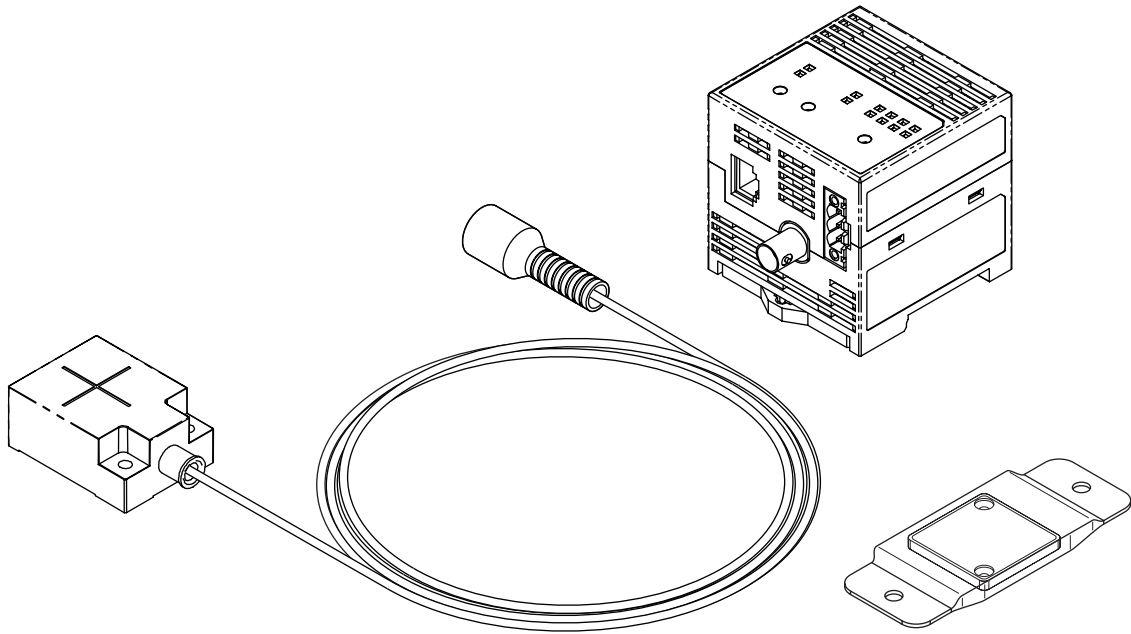
SECTION 1

Product Overview

 Features	14
 Part Names and Functions	16
 System Configuration	21
 Application Flowchart	22

Features

The V680-series RFID System uses electromagnetic induction and supports the ISO/IEC18000-3 (ISO/IEC15693) RFID system international standards.



■ Highly Reliable Tag Communications

The V680 features highly reliable ID Tag communications developed through the V600-series RFID Systems, making it easy to use on-site.

■ Compatible with FL Remote

The FL Remote ID is compatible with the FL Remote system, a remote I/O system based on FL-net (OPCN-2). It can be easily installed using LAN cables and easily programmed through I/O controls.

■ Compact Design with an Internal Amplifier

With a compact size of $65 \times 65 \times 65$ (W $\times$ H $\times$ D) mm, the FL Remote ID requires less space for installation.

■ Antennas and Tags with Superior Environmental Resistance

Fluororesin has superior environmental resistance, and is used for the external coatings of the Antenna case, Antenna cable, and the ID Tags.

■ EEPROM Memory Capacity of 1,000 Bytes

The ID Tags have 1,000 bytes of EEPROM memory capacity. They can be used to store various data, which can be rewritten up to 100,000 times per block if used at an ambient temperature not exceeding 25°C.

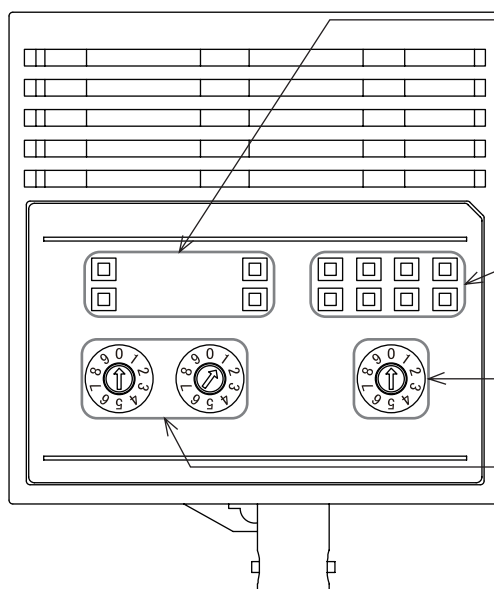
■ ID Tag Service Life Warning Management

The EEPROM has a service life of 100,000 data write operations. With the FL Remote ID, the service life for data write operations of ID Tags can be managed automatically. The total number of data write operations to each block of the ID Tag is counted and saved to a special area of each ID Tag. Warning is output if the number of data write operations exceeds 100,000.

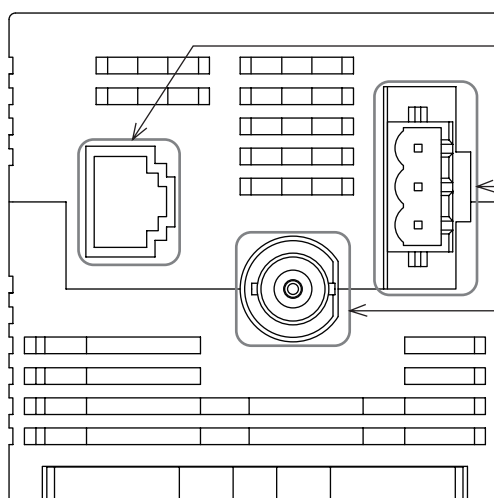
Note: A memory capacity of 992 bytes is required to enable ID Tag service life warning management.

Part Names and Functions

Part Names



- Operation Indicators
 - DEV: Unit status (green/red)
 - RMT: FL Remote network status (green/red)
 - T/R: ID Tag communications status (yellow)
 - NORMAL/ERROR: FL Remote ID operation result (green/red)
- Data Display
 - Data display (green)
 - Error code display (red)
- Mode Switch
 - FL Remote ID operation mode setting switch
- Node Address Switch
 - Node Address Switches (01 to 64)



- FL Remote Connector
 - Connects to FL Remote Master Unit
- Power Supply Terminals
 - Connect to 24-VDC power.
 - Recommended Power Supply: S8VS-03024 (OMRON)
- Antenna Connector
 - Connects to V680-HS63-SP Antenna

■ Operation Indicators

■ DEV (Device Status)

The DEV indicator displays the Unit status.

Status	Definition
	Lit green Normal
	Lit red Fatal error
	Flashing red Non-fatal error
	Not lit No power

■ RMT (Remote Status)

The RMT indicator displays the FL Remote network status.

Status	Definition
	Lit green Adding link/Participating in remote communications
	Flashing green Adding link/Leaving remote communications
	Flashing green and red Adding link/Remote classification error or setting error
	Lit red Duplicate node address or duplicate common address
	Flashing red Withdrawn from link
	Not lit Not linked.

■ T/R

The TR indicator displays the Tag communications status.

Status	Definition
	Lit yellow Tag is communicating
	Not lit Standby

■ NORMAL/ERROR

Status	Definition
	Lit green Normal end
	Lit red Error end
	Not lit Standby

■ Data Display and Error Code Display

The Data Display shows the first byte of data that was read or written when communications ends normally. It displays the error code if communications ends in an error.

Status	Definition
	Lit green Data displayed.
	Lit red System error displayed.
	Flashing red Error code displayed.
	Not lit Display turned OFF.



CHECK!

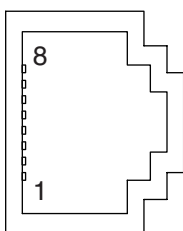
For details, refer to the *RFID-related Errors*.



p.64

■ FL Remote Connector Port

This connector connects the FL Remote to the Master Unit.

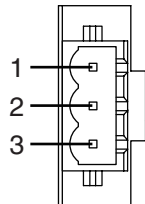


Pin No.	Name	Description	I/O
1	TX_D1+	Transmitted data +	Output
2	TX_D1–	Transmitted data –	Output
3	RX_D2+	Received data +	Input
4	---		---
5	---		---
6	RX_D2–	Received data –	Input
7	---		---
8	---		---
Hood	GR	Internal functional ground	---

■ Power Supply Terminals

The power supply terminals supply 24-VDC power using the included connector.

Included connector model: FKC2.5/3-ST-5.08-RF (Phoenix Contact)



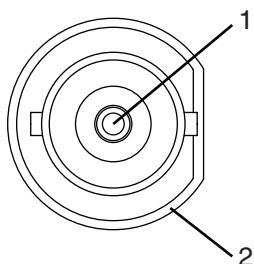
Pin No.	Name	Description	I/O
1	24V	24V	---
2	GND	GND	---
3	GR	Functional ground (Ground to 100 Ω or less.)	---



Use the recommended OMRON Power Supply, the S8VS-03024.

■ Antenna Connector Port

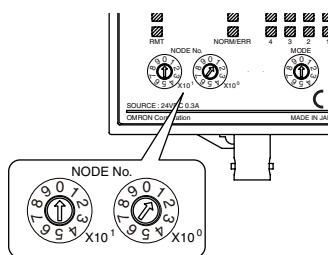
Connects the V680-HS63-SP Antenna.



Pin No.	Name	Description	I/O
1	S	Signal line	---
2	GND	Analog ground	---

■ Node Address Switches

The node address switches set the FL Remote Node Address. This node address is used as the right-most part of the IP address (e.g., xx of 192.168.250.xx).



Item	Description
Setting method	Two-digit decimal number The left rotary switch sets the 10s digit, and the right rotary switch set the 1s digit.
Setting range	01 to 64 The default setting is 01.

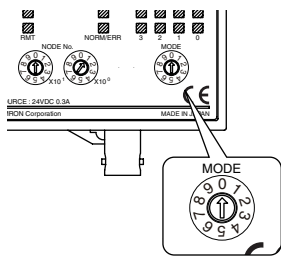


An address error will occur if "00" or "65" to "99" are set.

Turn the power OFF before setting the node address switches. The node address that is set when the power is turned ON will be valid.

■ Mode Switch

The mode switch sets the FL Remote ID operation mode.



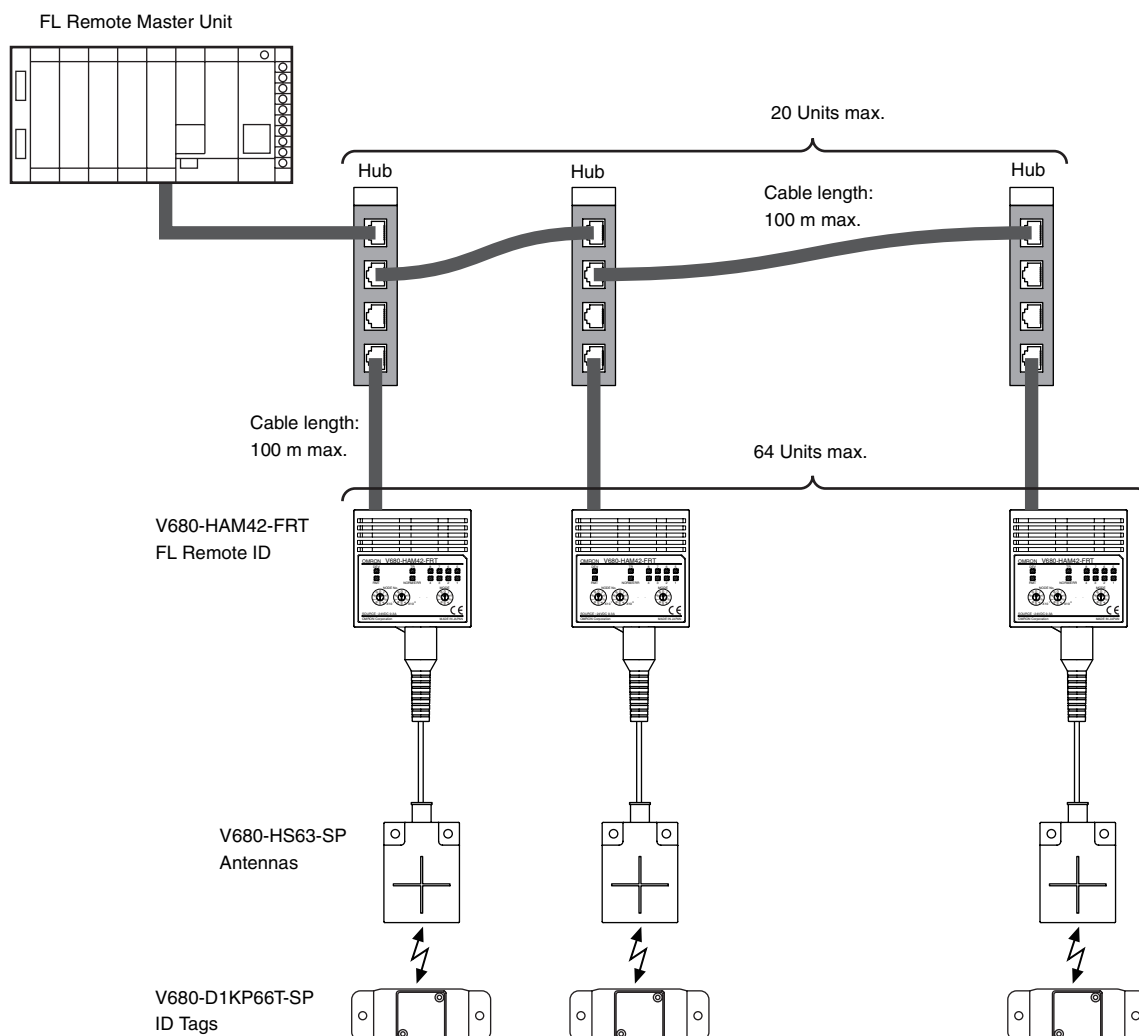
No.	Item	Description
0	Trigger	The input signal triggers communications and outputs the result.
1	Auto mode	Communications are repeatedly executed and the results are output.
2	Test mode	Operation can be checked while disconnected from the Master Unit by reading 4 bytes from address 00.
3	Noise level measurement mode	The noise conditions around the Antenna can be measured without connecting to the Master Unit.
Other	-	(A mode setting error will occur if any other settings are made.)



Turn the power OFF before setting the mode switch. The mode that is set when the power is turned ON will be valid.

System Configuration

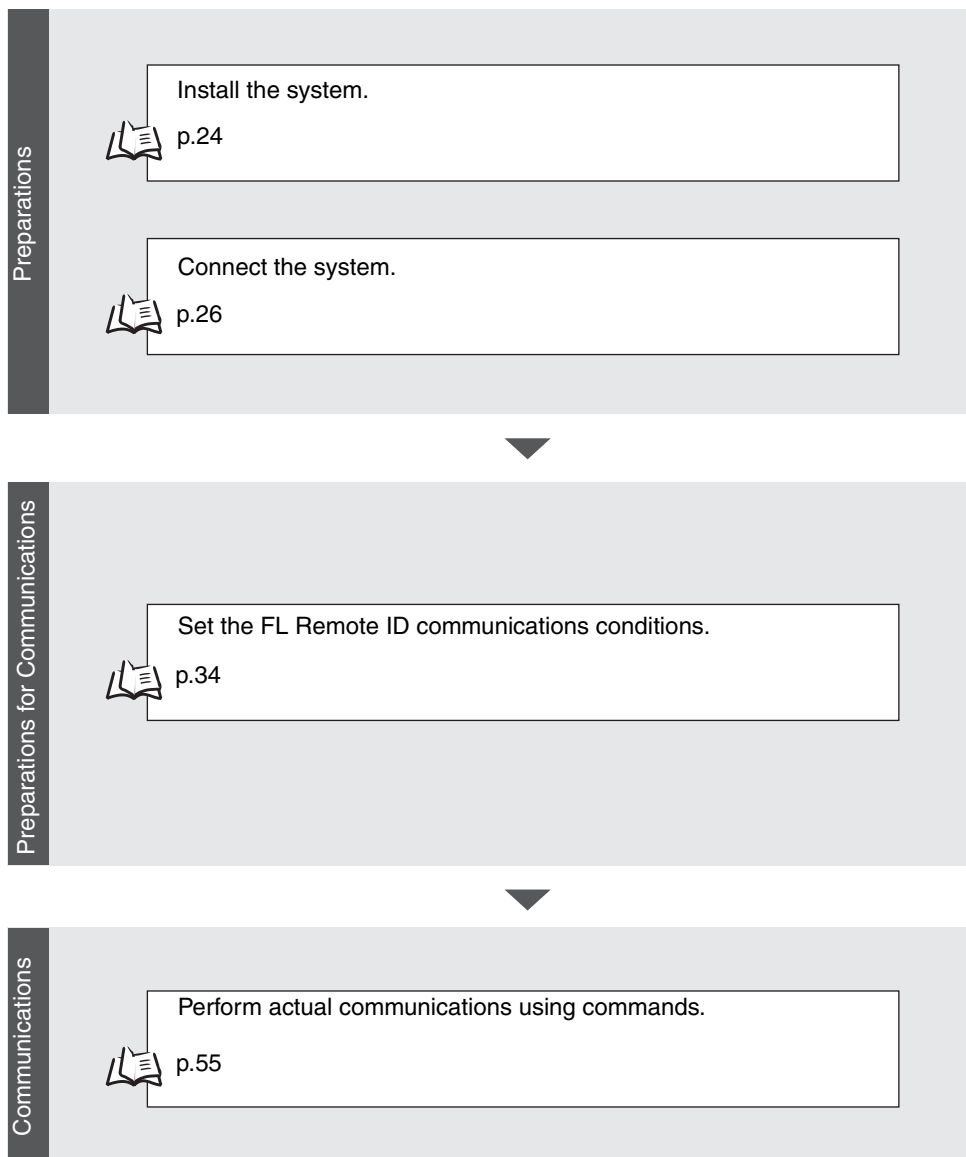
The system configuration is shown in the following figure.



Configuration Description

Name	Description
FL Remote Master	Use a JTEKT PLC that is compatible with the FL Remote for the FL Remote Master. Also use a programming tool that is compatible with the FL Remote Master. Contact JTEKT for product details.
Hub	Use the JTEKT FE-SWH05/08.
Cable	Use the communications cable for FL Remote (category 5 or higher, with shield). Use straight cables between Hubs and FL Remote IDs. Use a cross cable when connecting the FL Remote Master and FL Remote ID directly.
FL Remote ID	Up to 64 FL Remote ID Units can be connected. The V680-HS63-SP Antenna can be connected to communicate with V680-D1KP66T-SP ID Tags. Before use, check the restrictions on FL Remote Master Unit.

Application Flowchart



SECTION 2

Installation, Connections, and Wiring

 FL Remote ID	24
 Installing Antennas	29
 Installing ID Tags	31

FL Remote ID

Installation

To ensure full functionality of the V680-HAM42-FRT FL Remote ID, follow the instructions provided in this section for installation.

Installation Site

Do not install the ID Controller in the following locations.

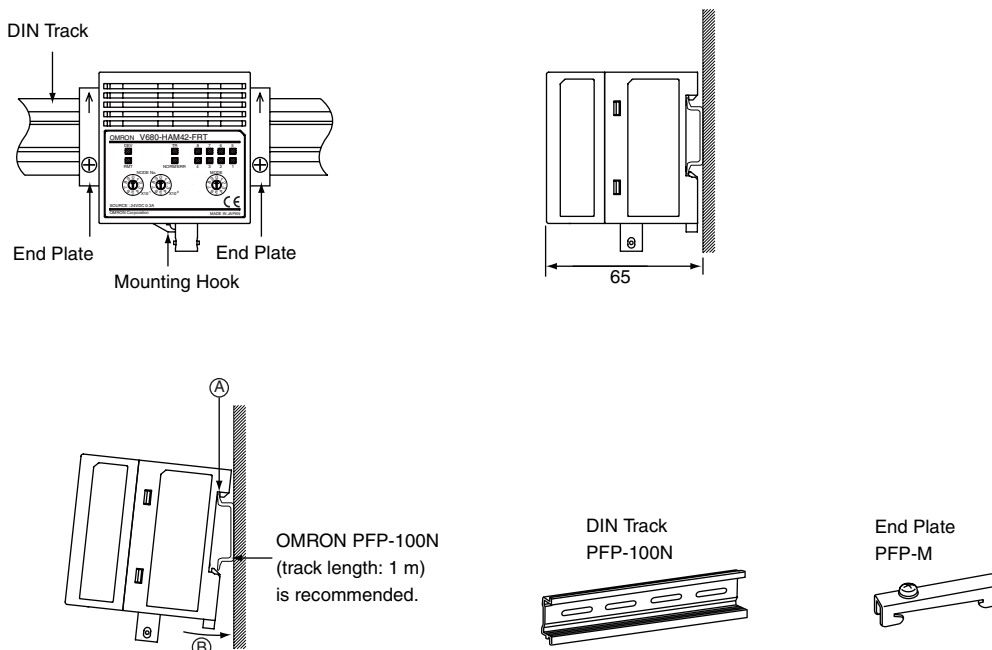
- Locations exposed to ambient temperatures that are not between -10 and 55°C or where there are radical temperature changes resulting in condensation
- Locations exposed to humidity that is not between 25% and 85%
- Locations subject to corrosive gas, flammable gas, dust, salt, or metal powder
- Locations that will expose the ID Controller to direct vibration or shock
- Locations exposed to direct sunlight
- Locations exposed to spray of water, oil, or chemicals
- Locations more than 2,000 m above sea level

Mounting in a Panel

The FL Remote ID Unit can be used at an ambient temperature range of -10 to 55°C . Be sure to observe the following precautions.

- Make sure that the Unit is provided with sufficient ventilation space.
- Do not install the Unit close to heaters, transformers, or large-capacity resistors that radiate excessive heat.

Installation Method



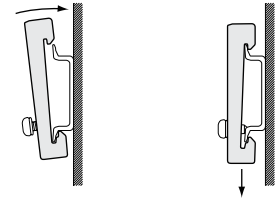
1. First hook the FL Remote ID Unit to part A, then press it in direction B to mount it to the DIN Track.
2. To disconnect the FL Remote ID Unit from the DIN Track, pull the mounting hook downwards, and then lift the Unit upwards.



Attaching the End Plates

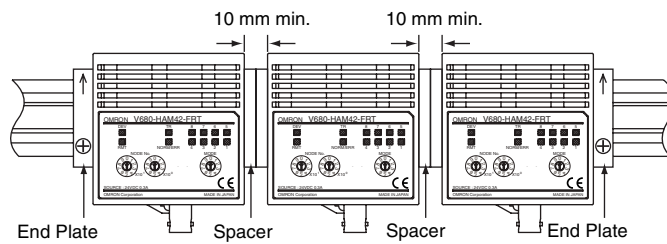
To mount an End Plate easily, first hook the bottom of the End Plate and then hook the top on the DIN Track, pull the End Plate downwards and tighten the screw.

Recommended tightening torque: 1.2 N-m.

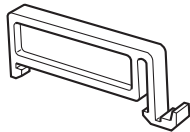


■ Mounting Interval

The V680-HAM42-FRT FL Remote ID Units will generate heat if they are mounted side-by-side. Leave space between Units of at least 10 mm.



Use at least 2 OMRON DIN Track Spacers. (Each Spacer is 5 mm wide.)



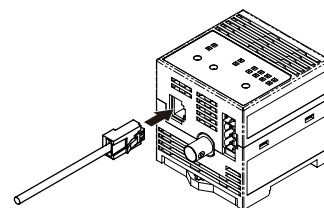
Spacer
PFP-S

Connection and Wiring

■ FL Remote Connector

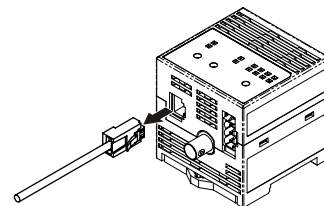
■ Installation

Hold the connector part of the cable and insert it into the FL Remote Port.



■ Removal

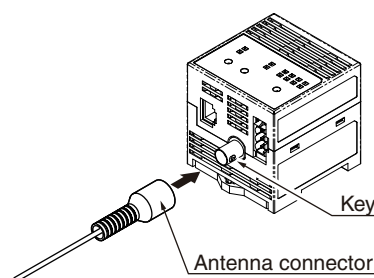
Unlock the connector and pull it out.



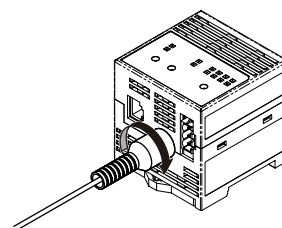
■ Antenna Connector

■ Mounting the Antenna

1. Hold the connector part of the Antenna and insert it into the Antenna port while matching the key on the Unit with the groove on the connector.

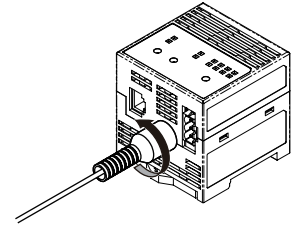


-
2. Turn the connector clockwise to lock it in place.



▪ Removing the Antenna

1. Turn the connector in counterclockwise to release the lock.

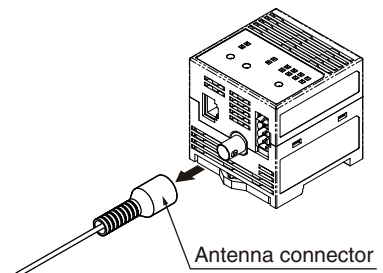


2. Pull the connector straight out of the port.



CHECK!

The connector cannot be removed without turning it to release the lock. If the cable is pulled without releasing the lock, it may cause the cable or wires to break. Make sure that the lock is released before pulling out the connector.

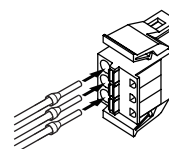


■ Power Supply Connector

Use the connector that comes with the Unit. You must provide the connecting cable.

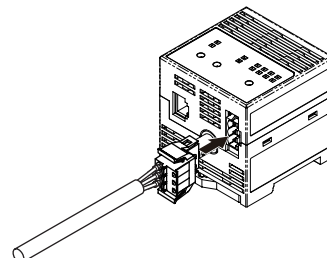
		Brand	Model	Note
Cable	Power line	---	---	1.0 mm ² (equivalent to AWG18)
Connector		Phoenix Contact	FKC2.5/3-ST-5.08-RF	---
Crimp Terminal	When one line is connected to one terminal		AI1-10RD	---
	When two lines are connected to one terminal		AI-TWIN2×1-10RD	---
Crimping Tool				CRIMPFOX UD6

1. Attach the crimp terminals to the sections of the cable where the sheath has been stripped.
2. Make sure the connector is facing the right direction and insert each crimp terminal into the correct connector hole.



3. Once all of the cables have been connected to the connector, attach the connector to the FL Remote ID Unit.

Align the cable connector with the connector on the FL Remote ID Unit. Hold the connector body and push the connector firmly into place.



CHECK!

Removing the Connector

Remove the connector by pressing in on the lock on the cable connector to release the lock and pulling the connector straight out. If the connector is difficult to remove, press on the FL Remote ID Unit while pulling on the connector.



CHECK!

Do not connect cables to the connector after attaching the connector to the FL Remote ID Unit.



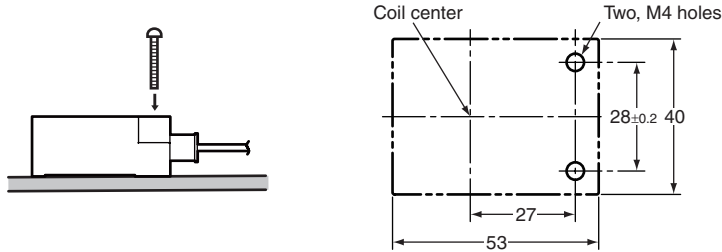
CHECK!

Use the recommended Power Supply (S8VS-03024, OMRON).

Installing Antennas

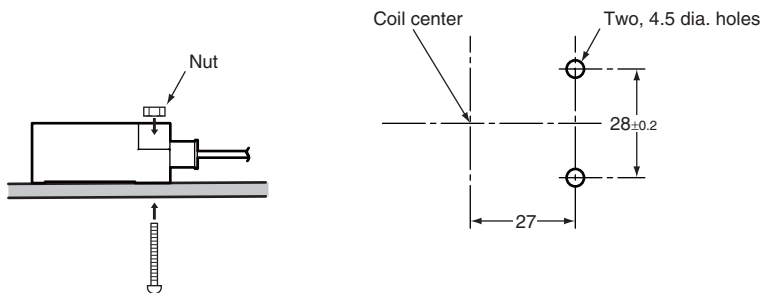
Installation from the Front

Secure the Unit with M4 screws and washers.



Installation from the Back

Secure the Unit with M4 screws and washers.

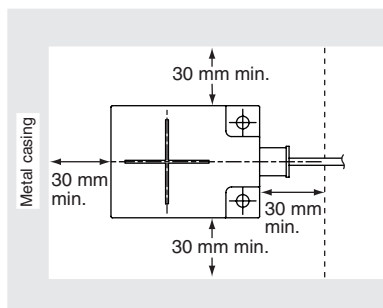
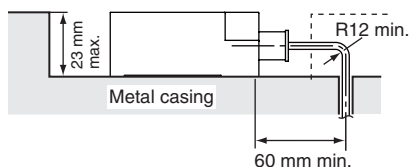


Securely tighten screws to a maximum torque of 1.2 N-m.

Effect of Surrounding Metals on the Antenna (Reference)

Instead of mounting the Antenna on the surface, it can be embedded into the metal work to prevent collision with the workpiece and/or equipment.

If the Antenna is too close to metal, the communications capabilities may be significantly affected. Make sure that the following minimum distances are maintained when mounting the Antenna this way.



Do not bend the cable into a curve tighter than 12 mm in radius.

CHECK!



The communications distance will be reduced significantly if the Antenna is installed closer than 30 mm to metal surfaces.

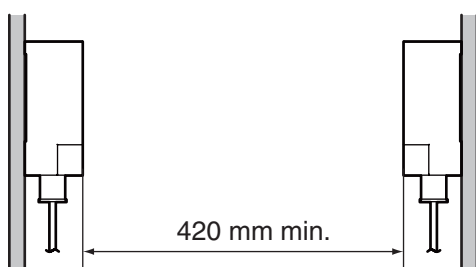
CHECK!

Mutual Interference between Antennas (Reference)

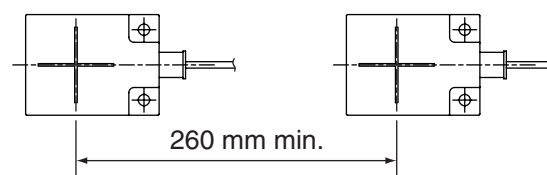
To prevent malfunctioning due to mutual interference when using more than one Antenna, leave sufficient space between them as shown in the following diagrams.

■ V680-HS63-SP

Installing the Antennas Facing Each Other



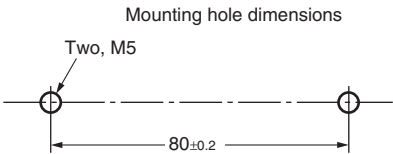
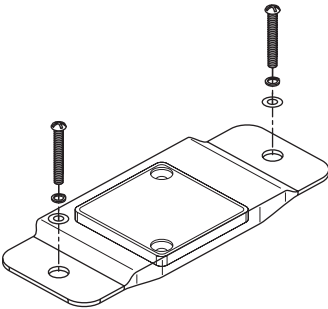
Installing the Antennas in Parallel



Installing ID Tags

Mounting the ID Tags

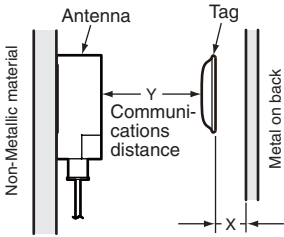
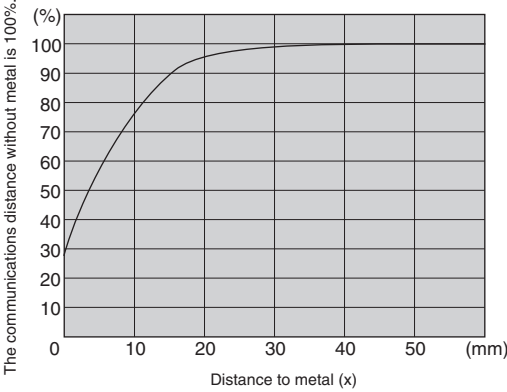
Mount the ID Tags with M5 screws and washers.
Tightening torque: 1.2 N·m.
There are no restrictions to the mounting direction of the ID Tags or the direction of movement for Antennas.



Effect of Metal behind Tags (Reference)

Mounting ID Tags to metal workpieces or palettes will affect the communications capabilities. Place non-metallic parts (e.g., plastic or resin) between the metallic parts by referring to the following relationship between the distance between the ID Tag and the metallic body versus the communications distance.

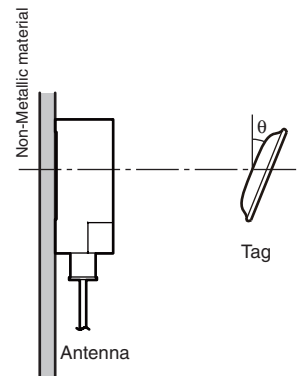
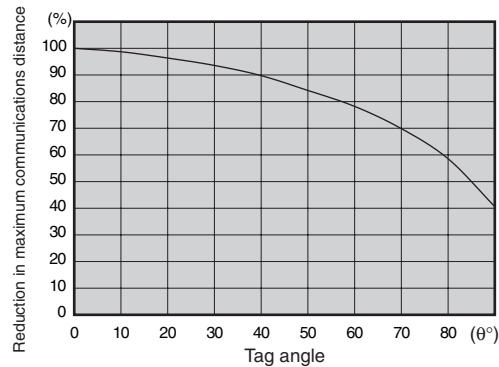
V680-HS63-SP & V680-D1KP66T-SP



Influence of Tag Angle (Reference)

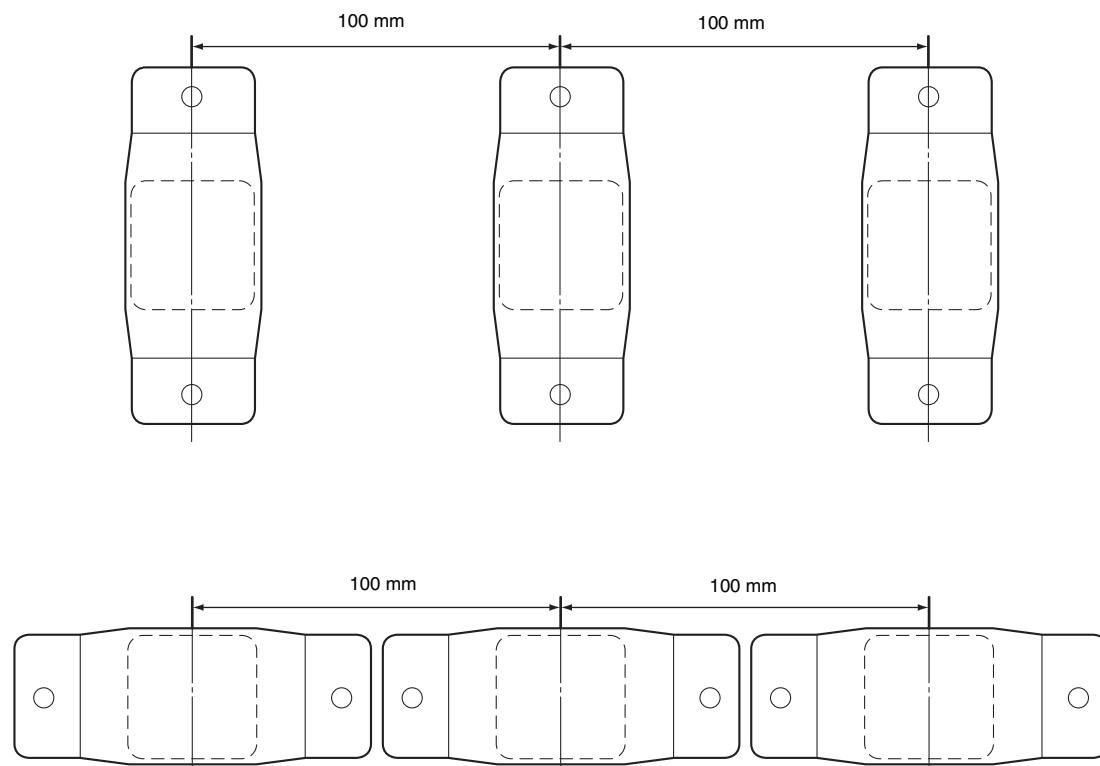
Communications are possible even when an Antenna and a Tag are mounted at an angle, but the communications distance will be shortened. The relation between the angle and the communications distance is shown below.

V680-HS63-SP & V680-D1KP66T-SP



Mutual Interference with Tags (Reference)

To prevent malfunctioning due to mutual interference when using more than one Tag, leave sufficient space between them as shown in the following diagram.



SECTION 3

Preparations for Communications

 Parameter Settings for FL Remote Communications	34
---	----

Parameter Settings for FL Remote Communications

Set the following link parameters of the JTEKT PLC to enable using the FL Remote ID. Refer to the JTEKT Master Operation Manual for details on how to set the Link No., Slot No., and Link Module Name.



Use JTEKT PCwin Ver 8.** Programming Tool to set the parameters of the FL Remote ID.

Communications Transmission Bytes

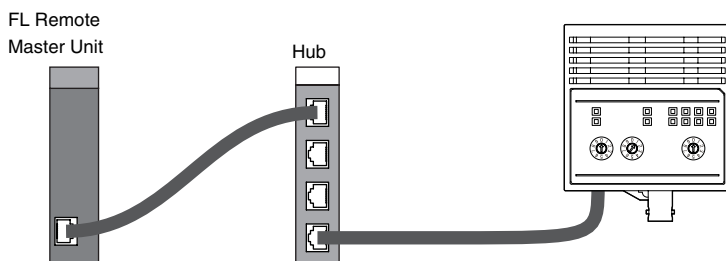
The number of communications transmission bytes for the FL Remote ID is shown in the following table.

No. of input bytes	No. of output bytes
8	8

Example Settings

This section describes the parameters that can be set with PCwin.

Example of System Configuration



I/O Module Settings

Select **I/O Module** from the PCwin Parameter Menu and select the rack number and slot number where the Module is installed.

Click the **Settings** Button in the I/O Module Dialog Box and select the following settings for the I/O Module.

- Module Type: (R) Special/Communications
- Module Name: FL Remote M

Link Parameter Settings

Select **Link Parameter** from the parameter menu and select the program number and link number.

Click **Link Settings** in the Link Parameter Settings Dialog Box. Select the following Link Module name.

- Link Module Name: FL Remote M

■ FL Remote M Detail Settings

Click the **Details** Button in the Link Parameter Settings Dialog Box and select the parameter that you want to use.

The FL Remote ID does not have a diagnostic function. Parameters cannot be set for this function.

■ Slave Settings Communications Procedure

Click the **Slave Settings** (E) Button in the FL Remote M Detail Settings Dialog Box and set the parameters as shown below.

- Slave Connection Settings Select
- Transfer bytes Settings 8 input bytes, 8 output bytes
- Expansion Settings Disable

MEMO

SECTION 4

Functions

☒ Communications Specifications	38
☒ Write Protection	41
☒ Noise Measurement	44
☒ ID Tag Service Life Warning Management	45

Communications Specifications

With the FL Remote ID, communications with the ID Tags is determined by the operating mode set on the mode switch, the command selected, and the options selected to execute the command.

Operating mode

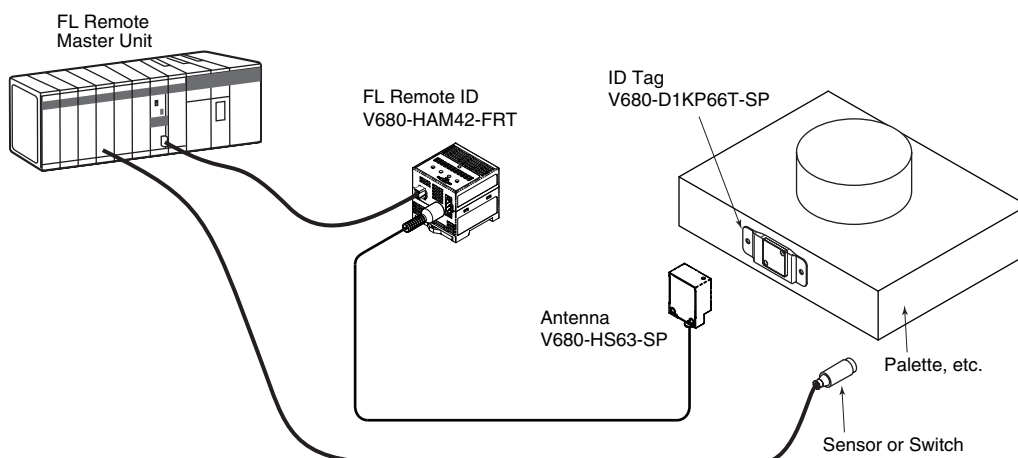
There are four operating modes.



For the mode settings, refer to *Part Names and Functions* in *Section 1*.
p.16

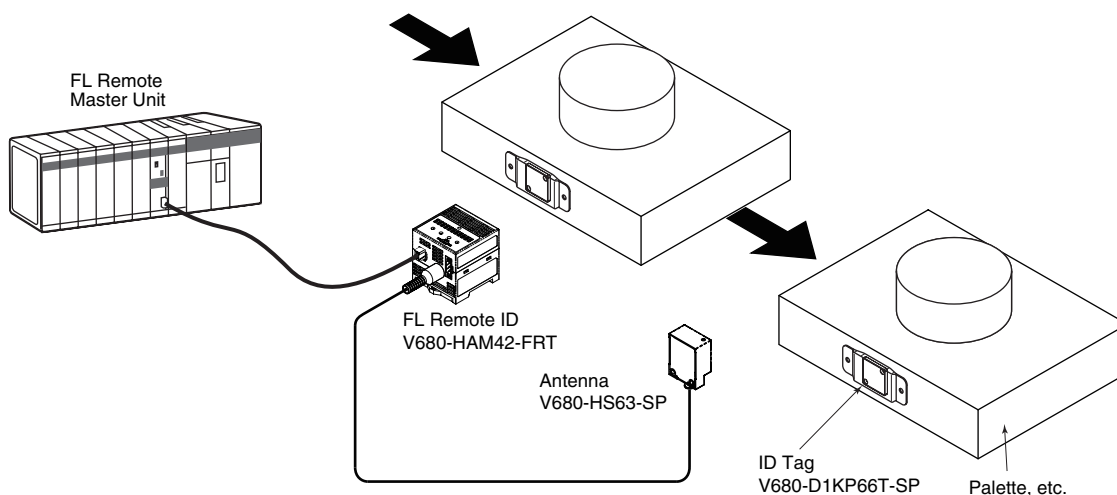
Trigger Mode

When the ID Tag on a workpiece or palette moves within the communications range of the Antenna, it is detected by a sensor or a switch. A control signal (trigger signal) is output from the PLC to the FL Remote ID, which triggers the FL Remote ID to begin communications with the ID Tag. The FL Remote ID reads the Tag data and outputs the results to the PLC.



Auto Mode

When the ID Tag of a workpiece or palette is within the communications range of the Antenna, the Remote ID automatically begins communications with the ID Tag and outputs the result to the PLC.



■ Test Mode

During system installation or maintenance, set the switch on the Unit to Test Mode. When the power supply is turned ON, the ID Tag data will be read, and the communications results will be displayed on the indicators.

■ Noise Level Measurement Mode

If communications with the ID Tag is unstable, set the switch on the Unit to the Noise Level Measurement Mode. When the power supply is turned ON, the noise around the Antenna will be measured, and the noise measurement results will be displayed on the indicators.

Commands

Communications with the ID Tag is controlled by commands allocated to the FL Remote signals.

- READ
- WRITE
- DATA FILL
- NOISE MEASUREMENT



CHECK!

Noise measurement is not a command used for communications with ID Tag, but a command used for maintenance. Refer to *Noise Measurement* for details.

 p.44

■ READ

Data in the ID Tag memory is read by specifying the number of bytes to process.

■ WRITE

Data is written to the ID Tag by specifying the memory address, number of bytes to process, and the data.

■ DATA FILL

Based on the specified address, number of blocks to process, and data, the specified memory area of the ID Tag is filled with the same data.

■ NOISE MEASUREMENT

The strength of noise received by the Antenna is measured.

Options

The following functions can be used by setting the control signal options settings.

- Communications Speed
- Write Protection
- Output Time
- ID Tag Service Life Warning Management

■ Communications Speed

The communications time required for writing large amounts of data to the ID Tag using the DATA FILL command can be reduced by setting the communications speed to high.

Be aware that the noise resistance may be lower during communications when this function is being used.



For details on the communications time, refer to *Communications Time (Reference)*.



■ Write Protection

Important data stored in the memory of an ID Tag, such as the product model or type, can be protected from being overwritten inadvertently by enabling the Write Protection function.



Refer to *Write Protection* for details.



■ Output Time

When auto mode is being used, the result output time can be set to either 100 ms or 500 ms.



Refer to *Timing Charts* for details on output timing.



■ ID Tag Service Life Warning Management

With the FL Remote ID, the service life for data write operations can be automatically managed, and a warning can be output if the number of data write operations exceeds 100,000.

A memory capacity of 992 bytes is required to enable ID Tag service life warning management.



Refer to *ID Tag Service Life Warning Management* for details.



Write Protection

The write protection function protects important data stored in the memory of a Tag, such as the product model or type, from being overwritten inadvertently.

Enable the write protection function after writing important data as described in this section.

Setting Write Protection

For the write protection function to be effective, it must be enabled or disabled in both the FL Remote ID settings and the ID Tag settings.

1. FL Remote ID Settings

The write protection function can be enabled or disabled by setting the write-protect bit of the FL Remote ID in the I/O Allocation Table.



Refer to the *I/O Allocation Table* and *Signal Names and Functions* for details.

CHECK!



p.52, p.53

2. ID Tag Settings

Write protection for individual ID Tags is set in the most significant bit of address 0000 hex.

Write protection is set in the 4 bytes from Tag address 0000 to 0003 hex.

Address \ Bit	7	6	5	4	3	2	1	0
0000 hex	Enable/disable	Upper two digits of start address (00 to 7F)						
0001 hex	Lower two digits of start address (00 to FF)							
0002 hex	Upper two digits of end address (00 to FF)							
0003 hex	Lower two digits of end address (00 to FF)							

- Write-protect bit (most significant bit of address 0000 hex)

1: Write-protected (Enable)

0: Not write-protected (Disable)

- Addresses in Tag Memory That Can Be Write Protected

Start address: 0000 to 7FFF hex

End address: 0000 to FFFF hex

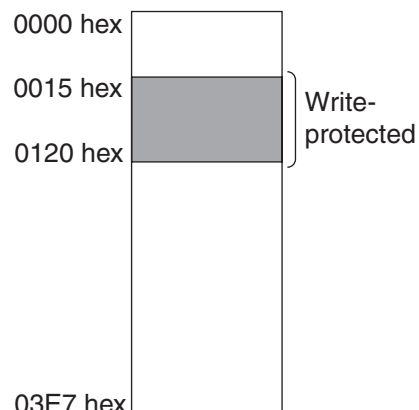
Note: If the write protection function is not used, the write protection setting addresses can be used as user memory. When doing this, make sure that the write-protect bit is disabled in the FL Remote ID.

■ Example of Write Protection

■ Start Address Is Lower Than the End Address

The memory area between the start address and end address will be write-protected.

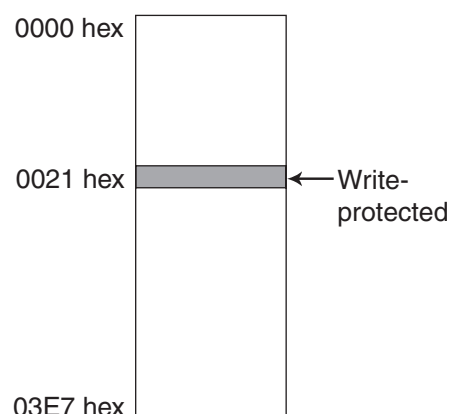
Address \ Bit	Upper digits				Lower digits			
0000 hex	1	0	0	0	0	0	0	0
	8				0			
0001 hex	0	0	0	1	0	1	0	1
	1				5			
0002 hex	0	0	0	0	0	0	0	1
	0				1			
0003 hex	0	0	1	0	0	0	0	0
	2				0			



■ Start Address Is Equal to End Address

Only the selected address (one byte) will be write-protected.

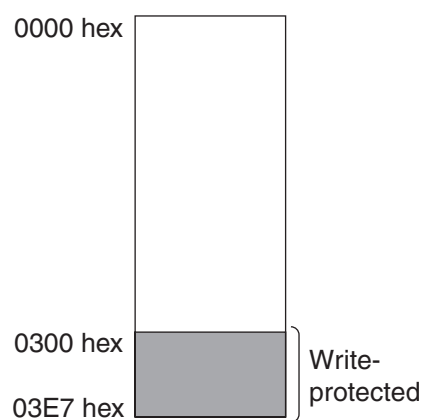
Address \ Bit	Upper digits				Lower digits			
0000 hex	1	0	0	0	0	0	0	0
	8				0			
0001 hex	0	0	1	0	0	0	0	1
	2				1			
0002 hex	0	0	0	0	0	0	0	0
	0				0			
0003 hex	0	0	1	0	0	0	0	1
	2				1			



■ End Address Is Higher than the Last ID Tag Address

The memory area between the start address and the last ID Tag address will be write-protected.

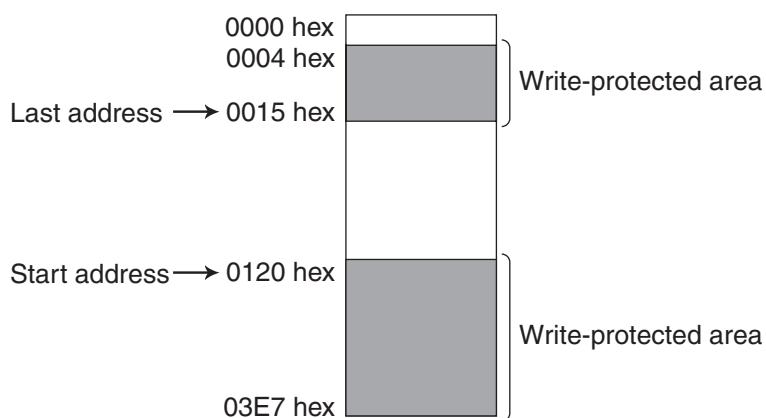
Address \ Bit	Upper digits				Lower digits			
0000 hex	1	0	0	0	0	0	1	1
	8				3			
0001 hex	0	0	0	0	0	0	0	0
	0				0			
0002 hex	0	0	0	0	0	0	1	1
	0				3			
0003 hex	1	1	1	1	1	1	1	1
	F				F			



Start Address Is Higher Than End Address

The memory area between the start address and the last ID Tag address, as well as the area between 0004 hex and the end address will be write-protected.

Address \ Bit	Upper digits				Lower digits			
0000 hex	1	0	0	0	0	0	0	1
	8				1			
0001 hex	0	0	1	0	0	0	0	0
	2				0			
0002 hex	0	0	0	0	0	0	0	0
	0				0			
0003 hex	0	0	0	1	0	1	0	1
	1				5			



Disabling Write Protection

Disabling Write Protection for Part of the ID Tags

Set the uppermost bit of 0000 hex to 0.

Disabling All Write Protection for the Whole RFID system

Set the Write Protection Enable Bit to 1 in the FL Remote ID.



Caution When Using Write Protection

The write protect function is a FL Remote ID function. It cannot be used with Reader/Writers manufactured by other companies.

Noise Measurement

You can check whether noise that affects communications with Tags exists in the surroundings where the Antenna and Reader/Writer are installed.

When a noise measurement command is sent from the PLC, the noise strength received by the Antenna is output in a value from 00 to 63.

To start in Noise Level Measurement Mode, set the mode switch to 3, and then start the Unit. The noise strength will be displayed in five levels on the data display. It can be checked directly from the FL Remote ID.



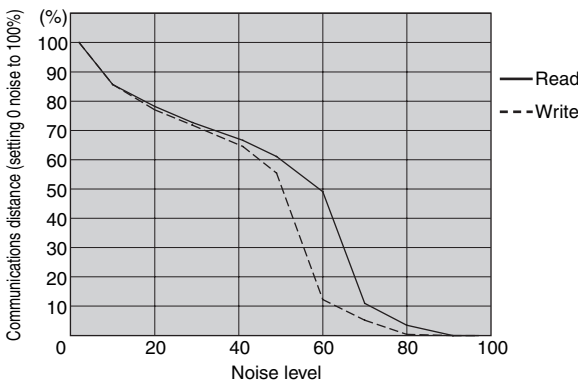
Refer to *NOISE MEASUREMENT* for details of the noise measurement command.
p.58

Relationship between Result Output and Display

Result output	DATA display status	Result Output	DATA display status
00 to 09	7 6 5 4 3 2 1 0	10 to 19	7 6 5 4 3 2 1 0
20 to 29	7 6 5 4 3 2 1 0	30 to 39	7 6 5 4 3 2 1 0
40 to 99	7 6 5 4 3 2 1 0		

Note: The result is output as a decimal value.

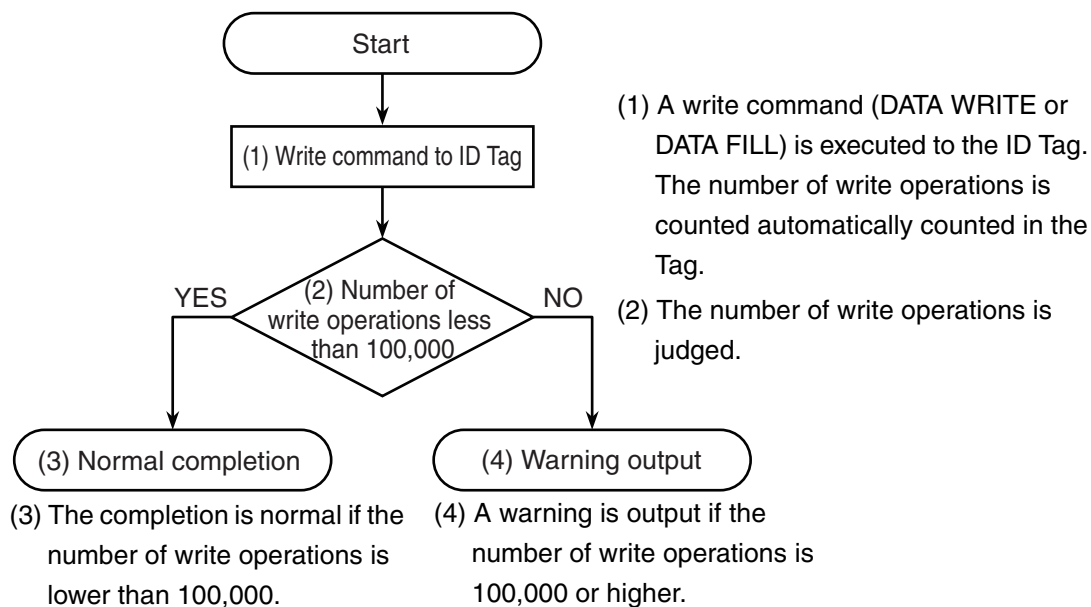
Example of Effect on Result Output and Communications Distance (Reference Data)



ID Tag Service Life Warning Management

The number of ID Tag write operations can be automatically managed in the ID Tag memory. A warning is output from the FL Remote ID to the PLC if the upper limit is exceeded. A memory capacity of 992 bytes is required to enable ID tag service life warning management.

Warning Management Process



Precaution on ID Tag Service Life Warning Management

ID tag service life management is a function of the FL Remote ID. ID tag service life management is not supported for other models or reader/writers made by other companies.

CHECK!

Setting ID Tag Service Life Warning Management

There are settings in the FL Remote ID to enable and disable ID Tag service life warning management. To use ID Tag service life warning management, always make the settings for the FL Remote ID.

■ Setting the FL Remote ID

ID Tag service life warning management for the FL Remote ID can be enabled or disabled by using the ID Tag Service Life Warning Bit in the I/O Allocation Table.



CHECK!

For details, refer to *I/O Allocation Table* and *Signal Names and Functions*.



p.52, p.53

Preparing ID Tags

To use ID Tag service life warning management, always initialize unused ID Tags.

■ Initializing ID Tags

Use the following procedure to initialize unused ID Tags if they are to be used with ID Tag service life warning management.

- (1) Disable the ID Tag service life warning management for FL the Remote ID.
- (2) Write 00 hex to the eight bytes from addresses 03E0 to 03E7 hex of the ID Tag.
- (3) Enable the ID Tag service life warning management for the FL Remote ID.



CHECK!

For details, refer to *I/O Allocation Table* and *Signal Names and Functions*.



p.52, p.53

Warning from ID Tag Service Life Warning Management

A warning will be output if ID Tag service life management warning management is enabled for the FL Remote ID and the number of write operations is 100,000 or higher.

■ Checking with I/O Allocation Table

When a warning is output with ID Tag service life warning management, the FL Remote ID will turn ON the ID Tag Service Life Warning Bit in the I/O Allocation Table.

The Normal End Bit will turn ON, but the Error End Bit will not turn ON.



CHECK!

For details, refer to *I/O Allocation Table* and *Signal Names and Functions*.

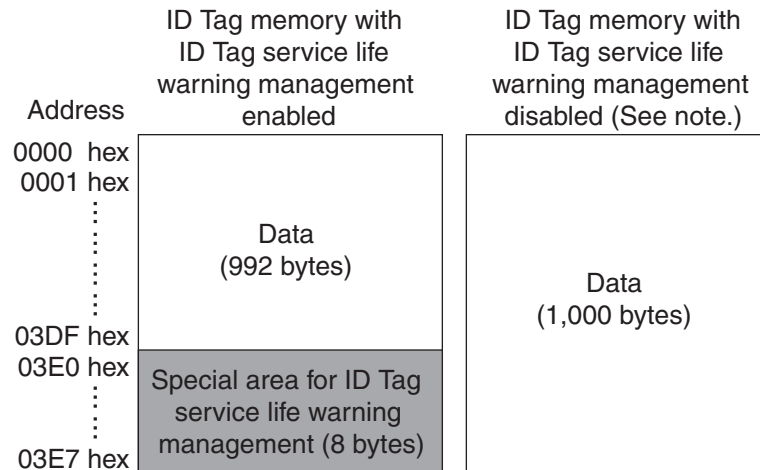


p.52, p.53

ID Tag Memory Map

When ID Tag service life warning management is enabled, the number of rewrites is saved in hexadecimal in the eight bytes from addresses 03E0 to 03E7 hex. Therefore, when ID Tag service life warning management is enabled, it will be possible to use only 992 bytes from addresses 0000 to 03DF hex.

When ID Tag service life warning management is disabled and an ID Controller, Handheld Reader/Writer, or controller made by another company is used, it will be possible to use all 1,000 bytes from addresses 0000 to 03E7 hex.



Note: Including ID Controllers, Handheld Reader/Writers, or controllers made by other companies.

Legend

Data
Special area for ID Tag service life warning management

DATA READ, DATA WRITE, and DATA FILL can be performed.

DATA READ, DATA WRITE, and DATA FILL cannot be performed.

Note: If ID Tag service life warning management is not used, addresses 03E0 to 03E7 hex can be used as user memory. Be sure to disable ID Tag service life warning management of the FL Remote ID to use these addresses.



ID Tag service life management is a function of FL Remote ID. If an ID Controller, Handheld Reader/writer, or controller made by another company is used, do not overwrite address 03E0 to 03E7 hex when using this function unless initializing unused ID Tags.

Area for ID Tag Service Life Warning Management

Addresses 03E0 to 03E7 hex are used for the ID Tag service life warning management. If ID Tag service life warning management is disabled or you are using an ID Controller, Handheld Reader/writer, or controller made by another company, refer to the following if this area will be read or written to.

Area for ID Tag service life warning management	
Address	
03E0 hex	All 00 hex fixed
03E1 hex	
03E2 hex	
03E3 hex	
03E4 hex	
03E5 hex	Number of overwrites
03E6 hex	
03E7 hex	

A service life warning will be output if this part is not 00 hex.

A service life warning will be output if this part is 100,000 or higher.

Always set the five bytes from 03E0 to 03E4 hex to 00 hex. When ID Tag service life warning management is enabled and data other than 00 hex is written, it will be treated as illegal data and a service life warning will be output.

The number of overwrites is recorded in the three bytes in addresses 03E5 to 03E7 hex. When ID tag service life warning management is enabled, the following operation will be performed according to the number of overwrites that is recorded.

Before writing		After writing	
Overwrites		Overwrites	Service life warning
0 to 99,998	→	1 to 99,999	Not output
99,999	→	100,000	Output
100,000 or higher	→	100,000 or higher	Output

(1) If the number of overwrites is lower than 100,000 after writing:

A service life warning will not be output. The number of overwrites will increase by 1.

(2) If the number of overwrites is 100,000 after writing:

A service life warning will be output. The number of overwrites will be 100,000.

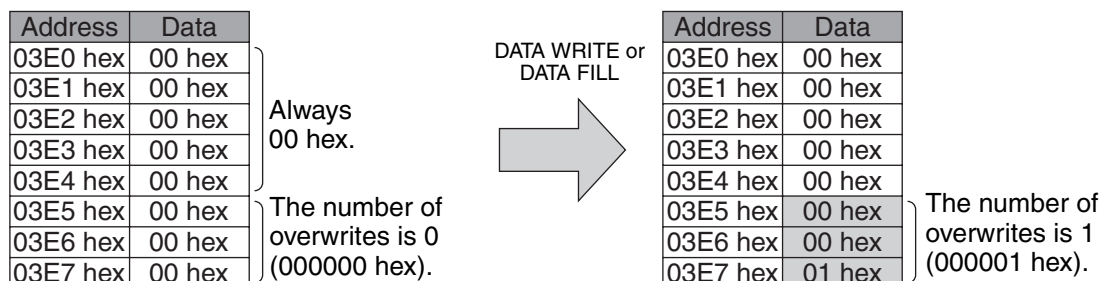
(3) If the number of overwrites is higher than 100,000 after writing:

A service life warning will be output. The number of overwrites will not change.

■ Examples of Area for ID Tag Service Life Warning Management

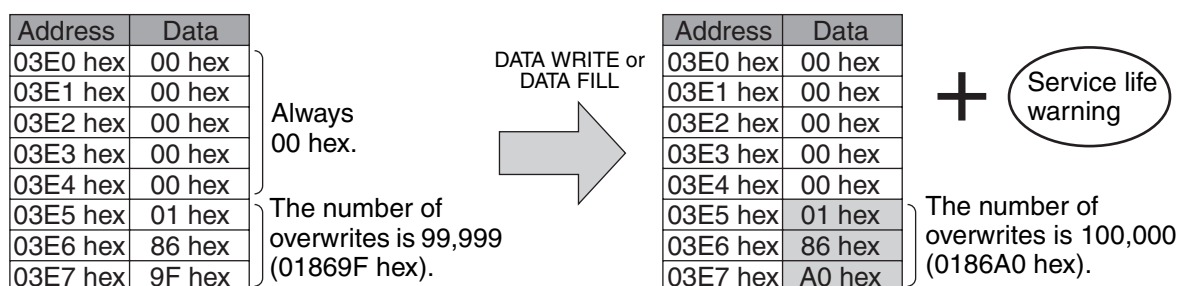
- If the Number of Overwrites Is 0 (i.e., If the Number of Overwrites Is Initialized):

Data will be written to the ID Tag the next time that DATA WRITE or DATA FILL is performed. A service life warning will not be output. The number of overwrites will change to 1.



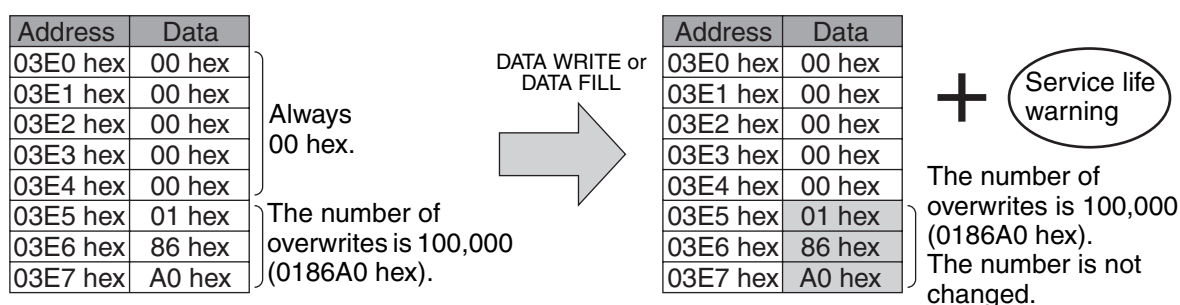
- If the Number of Overwrites Is 99,999:

Data will be written to the ID Tag the next time that DATA WRITE or DATA FILL is performed. Also, a service life warning will be output. The number of overwrites will change to 100,000.



- If the Number of Overwrites Is 100,000:

Data will be written to the ID Tag the next time that DATA WRITE or DATA FILL is performed. Also, a service life warning will be output. The number of overwrites will not change.



CHECK!

To read or write to the area for ID tag service life warning management, enable ID tag service life warning management or use an ID Controller, handheld reader/writer, or a controller made by another company.

MEMO

SECTION 5

Communications

 I/O Specifications	52
 Detailed Command Settings	55
 Timing Charts	59

I/O Specifications

I/O Allocation Table

The FL Remote ID is allocated 64 inputs and 64 outputs in the PLC.

The inputs and outputs that are allocated depend on the node address of the FL Remote ID.

Master Unit to FL Remote ID

	Bits																			
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0				
CIO +0	TRG/ INHIBIT	Option specifications				NOT USED			Tag communications command specification (CMD)				Data length specification (LEN) (DATA READ, DATA WRITE)							
		Output time (OUTPUT TIME)	Write protec- tion (WRITE PRO- TECT)	Com- muni- cations speed (HISPD)	ID tag service life warning (ID TAG LIFE)				NOISE MEA- SURE- MENT (CMD3)	DATA FILL (CMD2)	DATA WRITE (CMD1)	DATA READ (CMD0)	4 bytes (LEN3)	3 bytes (LEN2)	2 bytes (LEN1)	1 bytes (LEN0)				
													Data length specification (LEN) (DATA FILL)							
													Specification × 8 bytes							
CIO +1	Start address (ADDR)																			
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0				
CIO +2	Second-byte data (OD1)								First-byte data (OD0)											
	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0				
CIO +3	Fourth-byte data (OD3)								Third-byte data (OD2)											
	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0				

FL Remote ID to Master Unit

	Bits																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
CIO +0	Test mode (TEST MODE)	Noise measurement mode (NOISE MODE)	NOT USED				BUSY	RUN	NOT USED							Error end (ERROR)	Normal end (NORMAL)
CIO +1	Error end type (ERR_SUB)																
	System error (ERR_SUB15)	Switch error (ERR_SUB14)	Command error (ERR_SUB13)	NOT USED				ID tag service life warning (ERR_SUB7)	ID system error 2 (ERR_SUB6)	ID system error 1 (ERR_SUB5)	Mismatch error (ERR_SUB4)	Protection error (ERR_SUB3)	Address error (ERR_SUB2)	ID tag communications error (ERR_SUB1)	ID tag missing error (ERR_SUB0)		
CIO +2	Second-byte data (ID1)								First-byte data (ID0)								
	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	
CIO +3	Fourth-byte data (ID3)								Third-byte data (ID2)								
	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	

Signal Names and Functions

■ Master Unit to FL Remote ID

Signal	Name	Function
OD 0-0 to OD 0-7	Write Data	Input data to write to ID Tags.
OD 1-0 to OD 1-7		
OD 2-0 to OD 2-7		
OD 3-0 to OD 3-7		
ADDR 0 to 15	Address	Specify the read, write, and data fill start addresses. Range of specification: 0000 to FFFF hex
LEN 0 to 3	Data Length	Specifies the data length for reading and writing. Specification method: 1 byte: Set LEN0 to 1. 2 bytes: Set LEN1 to 1. 3 bytes: Set LEN2 to 1 4 bytes: Set LEN3 to 1 Note: A command error will occur if no specification is set to 1 or if two or more specifications are set to 1.
		Specify the number of blocks to process in the ID Tag when using the DATA FILL command. Specification range: 0 to F hex Values of 1 to F hex specify the number of blocks to process (value specified × 8 bytes). A value of 0 hex specifies all blocks starting from the DATA FILL start address.
CMD 0 to 3	Command	Specify the command to execute. Specification method: DATA READ: Set CMD0 to 1. DATA WRITE: Set CMD1 to 1. DATA FILL: Set CMD2 to 1. NOISE MEASUREMENT: Set CMD3 to 1. Note: A command error will occur if no specification is set to 1 or if two or more specifications are set to 1.
TRG/ $\overline{\text{INHIBIT}}$	Execution Control	When in trigger mode, set this signal to 1 to start communications with an ID Tag. When in auto mode, set this signal to 0 to stop, and to 1 to start communications with ID Tags.
HISPD	Communications Speed	Set to 0 for normal communications speed. Set to 1 for high speed communications.
WRITE PROTECT	Write Protection	Set to 0 to enable the write protection function for FL Remote ID. Set to 1 to disable the write protection function for FL Remote ID.
OUTPUT TIME	Output Time	Function can be enabled in Auto Mode only. Set to 0 to set a 100-ms result output time. Set to 1 to set a 500-ms result output time.
ID TAG LIFE	ID Tag Service Life Warning Management	Set to 0 to enable ID tag service life warning management. Set to 1 to disable ID tag service life warning management.

■ FL Remote ID to Master Unit

Signal	Name	Function
TEST MODE	Test Mode	Outputs 1 during operation in test mode when the mode switch is set to 2.
NOISE MODE	Noise Measurement Mode	Outputs 1 during operation in noise measurement mode when the mode switch is set to 3.
ID 0-0 to 7	READ DATA	Outputs data read from ID Tags when DATA READ is performed. Outputs measured values when noise measurement is performed.
ID 1-0 to 7		
ID 2-0 to 7		
ID 3-0 to 7		
RUN	Operating	Outputs 1 when the FL Remote ID is running normally.
BUSY	Executing	Outputs 1 when TRG is 1 in trigger mode. Outputs 1 when INHIBIT is 1 in auto mode.
NORMAL	Normal End	Outputs 1 when communications with ID Tags was terminated normally.
ERROR	Error End	Outputs 1 when communications with an ID Tag was terminated because of an error. By checking the type of ERR_SUB□, the error details can be checked.
ERR_SUB 15	System Error	Outputs 1 when FL Remote ID cannot be operated.
ERR_SUB 14	Switch Error	Outputs 1 when there is an error in the mode switch setting.
ERR_SUB 13	Command Error	Outputs 1 when there is a command error or the command cannot be received.
ERR_SUB 7	ID Tag Service Life Warning	Outputs 1 when the number of ID Tag overwrites is 100,000 or higher.
ERR_SUB 6	ID System Error 2	Outputs 1 when an ID Tag that is not supported by the FL Remote ID was used.
ERR_SUB 5	ID System Error 1	Outputs 1 when an ID Tag that is not supported by the FL Remote ID was used.
ERR_SUB 4	Mismatch Error	Outputs 1 when data was not correctly written to the ID Tag.
ERR_SUB 3	Protection Error	Outputs 1 when a command was executed to write data to the write-protected area of an ID Tag.
ERR_SUB 2	Address Error	Outputs 1 when the memory area specified by the command was outside the memory area of the ID Tag.
ERR_SUB 1	ID Tag Communications Error	Outputs 1 when the ID Tag was detected but communications could not be ended normally with the Tag in trigger mode.
ERR_SUB 0	ID Tag Missing Error	Outputs 1 when a ID Tag could not be detected in trigger mode was used.

Detailed Command Settings

The FL Remote ID commands are listed in the following tables.

DATA READ

Master Unit to FL Remote ID

Signal	Bit length	Value	Description
CMD	4	0001 _B	Data read
LEN	4	0001 _B	Reads 1 byte.
		0010 _B	Reads 2 bytes.
		0100 _B	Reads 3 bytes.
		1000 _B	Reads 4 bytes.
		Other	Command error
ADDR	16	0000 to FFFF hex	Read start address

FL Remote ID to Master Unit

Signal	Bit length	Value	Description
NORMAL	1	0 or 1	Set to 1 when operation is ended normally.
ERROR	1	0 or 1	The corresponding bit is set to 1 if the command ends in an error.
ERR_SUB *	1	0 or 1	The corresponding bit is set to 1 if ID Tag communications end in an error. The details of the error are also given.
ID	32	---	Read data

Master Unit to FL Remote ID Settings Example

Example: Reading 2 Bytes of Data from Address 120 hex.

	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CIO +0	*	*	*	*	*	0	0	0	0	0	1	0	0	1	0	0
	Change according to the setting.					Fixed				DATA READ				2 bytes		
CIO +1	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	1
	Address 120															
CIO +2	0	1	1	1	1	0	0	0	0	0	0	1	0	0	1	0
	Fixed															
CIO +3	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	1
	Fixed															

DATA WRITE

Master Unit to FL Remote ID

Signal	Bit length	Value	Description
CMD	4	0010 _B	DATA WRITE
LEN	4	0001 _B	Writes 1 byte.
		0010 _B	Writes 2 bytes.
		0100 _B	Writes 3 bytes.
		1000 _B	Writes 4 bytes.
		Other	Command error
ADDR	16	0000 to FFFF hex	Write start address
OD	32	---	Write data

FL Remote ID to Master Unit

Signal	Bit length	Value	Description
NORMAL	1	0 or 1	Set to 1 when operation is ended normally.
ERROR	1	0 or 1	The corresponding bit is set to 1 if the command ends in an error.
ERR_SUB0 to ERR_SUB6, ERR_SUB13 to ERR_SUB15	1	0 or 1	The corresponding bit is set to 1 if ID Tag communications end in an error. The details of the error are also given.
ERR_SUB7	1	0 or 1	The corresponding bit is set to 1 if there is an ID tag service life warning.



When there is an ID Tag service life warning, the Normal End Bit will be turned ON and the Error End Bit will not be turned ON.

CHECK!

Master Unit to FL Remote ID Settings Example

Example: Writing Three Bytes "1278AB hex" Starting from Address 321 hex.

	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CIO +0	*	*	*	*	*	0	0	0	0	0	1	0	0	1	0	0
	Change according to the setting.					Fixed			DATA WRITE				3 bytes			
CIO +1	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	1
	Address 321															
CIO +2	0	1	1	1	1	0	0	0	0	0	0	1	0	0	1	0
	78 hex									12 hex						
CIO +3	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	1
	Fixed									AB hex						

DATA FILL

Master Unit to FL Remote ID

Signal	Bit length	Value	Description
CMD	4	0100 _B	DATA FILL
LEN	4	1 to F hex 0 hex	Number of blocks to process (specified number of blocks x 8 bytes) If the number of blocks is 0, all memory after the DATA FILL start address will be selected.
ADDR	16	0000 to FFFF hex	DATA FILL start address
OD 0	8	---	DATA FILL data Data between OD1 and OD3 is invalid.

FL Remote ID to Master Unit

Signal	Bit length	Value	Description
NORMAL	1	0 or 1	Set to 1 when operation is ended normally.
ERROR	1	0 or 1	The corresponding bit is set to 1 if the command ends in an error.
ERR_SUB0 to ERR_SUB6, ERR_SUB13 to ERR_SUB15	1	0 or 1	The corresponding bit is set to 1 if ID Tag communications end in an error. The details of the error are also given.
ERR_SUB7	1	0 or 1	The corresponding bit is set to 1 if there is an ID Tag service life warning.



When there is an ID Tag service life warning, the Normal End Bit will be turned ON and the Error End Bit will not be turned ON.

CHECK!

Master Unit to FL Remote ID Settings Example

Example: Filling with FF hex to 16 bytes from Address 6 hex (2 Blocks × 8 Bytes/Block)

	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CIO +0	*	*	*	*	*	0	0	0	0	1	0	0	0	0	1	0
	Change according to the setting.					Fixed			DATA FILL				2 Blocks			
CIO +1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
	Address 6 hex															
CIO +2	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Fixed									FF hex						
CIO +3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fixed									Fixed						

NOISE MEASUREMENT

Master Unit to FL Remote ID

Signal	Bit length	Value	Description
CMD	4	1000 _B	NOISE MEASUREMENT

FL Remote ID to Master Unit

Signal	Bit length	Value	Description
NORMAL	1	0 or 1	Set to 1 when operation is ended normally.
ERROR	1	0 or 1	The corresponding bit is set to 1 if the command ends in an error.
ERR_SUB *	1	0 or 1	The corresponding bit is set to 1 if ID Tag communications end in an error. The details of the error will also be given.
ID	32	---	Result of noise measurement ID0: Average noise level (00 hex to 99: decimal) ID1: Maximum noise level (00 hex to 99: decimal) ID2: Minimum noise level (00 hex to 99: decimal) ID3: Always 00 hex

Master Unit to FL Remote ID Settings Example

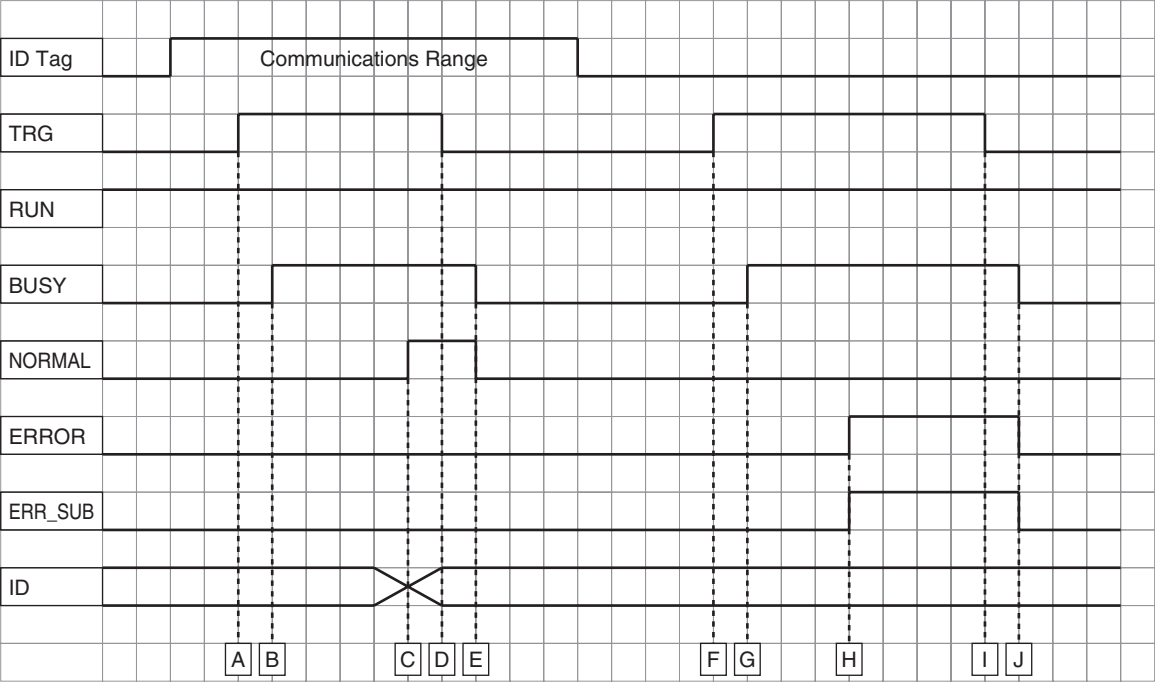
	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CIO +0	*	*	*	*	*	0	0	0	1	0	0	0	0	0	0	0
	Change according to the setting.					Fixed			NOISE MEASUREMENT				Fixed			
CIO +1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fixed															
CIO +2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fixed															
CIO +3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fixed															

Timing Charts



Trigger Mode

The trigger mode timing chart is shown below.



■ ID Tag within the Antenna's Communications Range

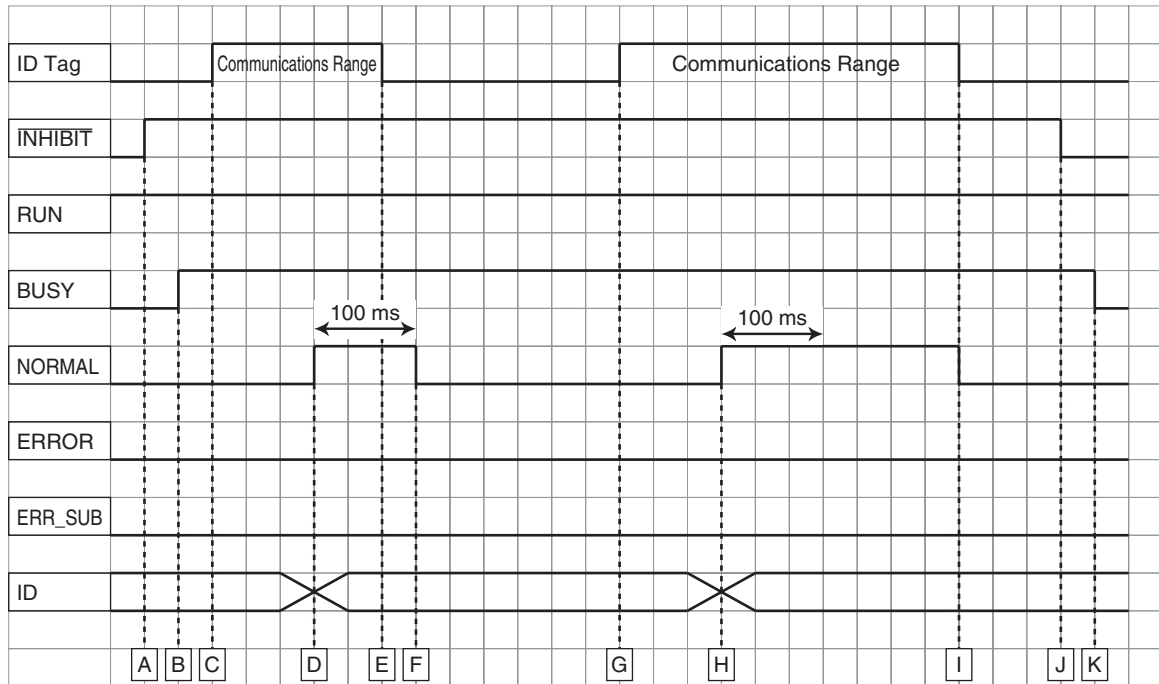
- A: The PLC turns ON TRG, and sends the execution command to FL Remote ID.
- B: The FL Remote ID receives TRG, determines the CMD (command), LEN (data length), and ADDR (start address), starts communications with ID Tag, and then turns ON BUSY.
- C: The FL Remote ID turns ON NORMAL when communications with ID Tag ends normally. For READ DATA, the read data is output to the FL Remote ID. For NOISE MEASUREMENT, the measurement data is output to the FL Remote ID.
- D: Check from PLC that NORMAL Signal is ON, and then turn OFF TRG.
- E: After confirming that TRG is OFF, the FL Remote ID turns OFF BUSY and NORMAL.

■ ID Tag Not within Communications Range

- F: The PLC turns ON TRG and sends execution command to FL Remote ID.
- G: The FL Remote ID receives TRG, starts communications with ID Tag, and then turns ON BUSY.
- H: When communications with ID Tag ends in an error, FL Remote ID turns ON ERROR (error end) and ERR_S UB0 (No ID Tag).
- I: Confirm that the ERROR1 signal is 1 (ON), and then turn OFF TRG.
- J: After confirming that TRG is OFF, the FL Remote ID turns OFF ERROR1 and ERR_SUB0.

Auto Mode with 100-ms Output Time

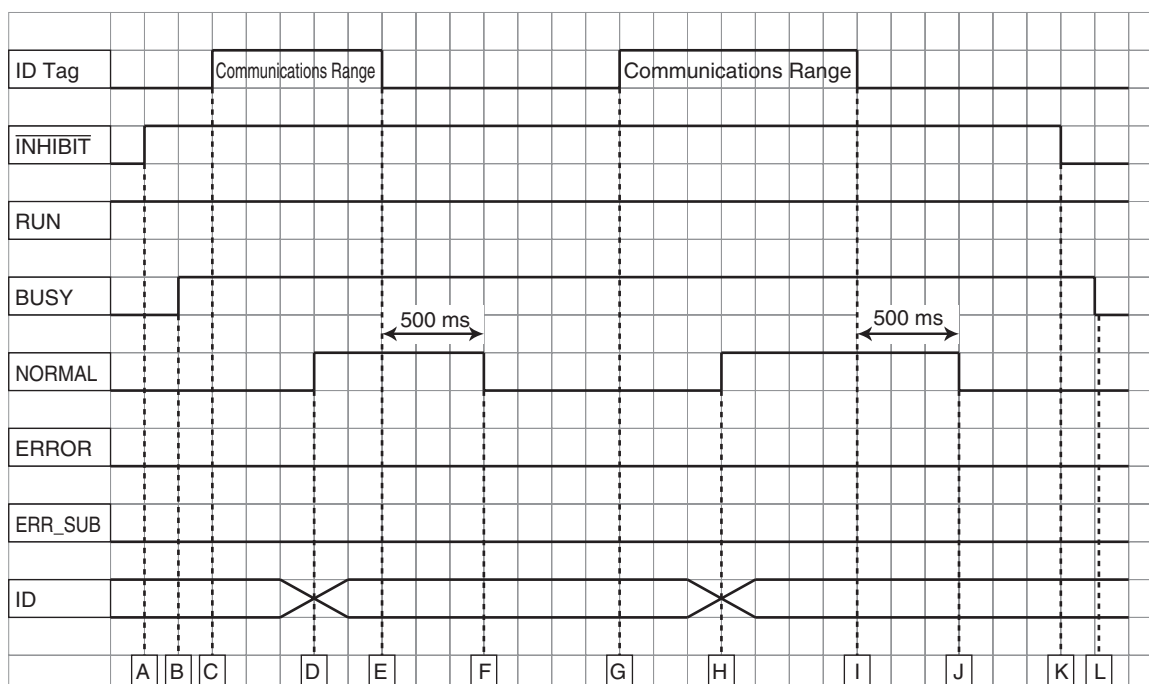
The timing chart for auto mode with a 100-ms output time is shown in the following figure.



- A: The PLC turns ON $\overline{\text{INHIBIT}}$ and sends the execution command to the FL Remote ID.
- B: The FL Remote ID checks that $\overline{\text{INHIBIT}}$ is ON, determines the CMD (command), LEN (data length), and ADDR (start address), and then turns ON BUSY.
- C: The FL Remote ID starts communications with an ID Tag when one enters the Antenna's communications range.
- D: The FL Remote ID turns ON NORMAL when communications with ID Tag end normally. For READ DATA, the read data is output to the FL Remote ID. For NOISE MEASUREMENT, the measurement data is output to the FL Remote ID.
- E: The ID Tag moves outside the Antenna's communications range within 100 ms after the FL Remote result is output.
- F: The result output is turned OFF 100 ms after the FL Remote ID result is output.
When measuring noise, the noise will be measured and the results will be output alternately while $\overline{\text{INHIBIT}}$ is OFF, regardless of whether there is an ID Tag present.
- G: The FL Remote ID starts communications with ID Tag when it enters the Antenna's communications range.
- H: The FL Remote ID turns ON NORMAL when communications with the ID Tag ends normally. For READ DATA, the read data is output to the FL Remote ID.
- I: Result output is turned OFF when the ID Tag moves outside the Antenna's communications range 100 ms after the FL Remote ID result is output.
- J: The PLC turns OFF $\overline{\text{INHIBIT}}$ to prevent command execution by the FL Remote ID.
- K: The FL Remote ID confirms that $\overline{\text{INHIBIT}}$ is OFF, and then turns OFF BUSY.

Auto Mode (500 ms Output Time)

The timing chart for auto mode with a 500-ms output time is shown in the following figure.



- A: The PLC turns ON $\overline{\text{INHIBIT}}$, and sends the execution command to the FL Remote ID.
- B: The FL Remote ID checks that $\overline{\text{INHIBIT}}$ is ON, determines the CMD (command), LEN (data length), and ADDR (start address), and then turns ON BUSY.
- C: The FL Remote ID starts communications with an ID Tag when one enters the Antenna's communications range.
- D: The FL Remote ID turns ON NORMAL when communications with the ID Tag ends normally. For READ DATA, the read data is output to the FL Remote ID. For NOISE MEASUREMENT, the measurement data is output to the FL Remote ID.
- E: The ID Tag moves out of the Antenna's communications range.
- F: The FL Remote ID waits for the ID Tag to leave the Antenna's communications range, and then turns OFF the result output 500 ms afterward.
When measuring noise, the noise will be measured and the results will be output alternately while $\overline{\text{INHIBIT}}$ is OFF, regardless of whether there is an ID Tag present.
- G: The FL Remote ID starts communications with the ID Tag when one enters the Antenna's communication range.
- H: The FL Remote ID turns ON NORMAL when communications with the ID Tag is finished. For READ DATA, the read data is output to the FL Remote ID.
- I: The ID Tag moves outside the antenna's communication range.
- J: The FL Remote ID waits for the ID Tag to move outside the Antenna's communications range, and then turns ON the result output 500 ms afterward.
- K: The PLC sets $\overline{\text{INHIBIT}}$ to 0 (OFF) to prevent command execution by the FL Remote ID.
- L: The FL Remote ID confirms that $\overline{\text{INHIBIT}}$ is OFF, and then turns OFF BUSY.

MEMO

SECTION 6

Troubleshooting

 Handling Errors	64
 Errors and Countermeasures	66
 Maintenance and Inspection	67

Handling Errors

Check the error status by looking at the LED indicators and the error output, and then take suitable actions.

FL Remote-related Errors

Check the DEV and RMT indicators for errors relating to the FL Remote network and hardware.

DEV (Device Status)

	Error	Corrective action
 Lit red	Hardware error	If the error continues after resetting the power, replace the FL Remote ID.
 Flashing red	Settings error	Set the node address switches within the correct range.

RMT (Remote Status)

	Error	Corrective action
 Flashing green and red	Adding to link/Setting error	Review the link parameter settings.
 Lit red	Duplicate node address	Assign unique node addresses to all nodes within the same network.
 Flashing red	Leaving link	Check whether the communications cable is connected correctly. If noise enters on the communications cable, the node made leave the link. Take suitable noise countermeasures.

RFID-related Errors

When the ERROR indicator lights, check the LED indicators from bit 7 to bit 0 or the error output for errors relating to RFID, and then take suitable actions.

LED	Output bit	Error	Corrective action
Bit 0 Flashing red	Error End + Tag Missing Error	An ID Tag could not be detected in trigger mode.	Change the control timing so that communications can be started while the ID Tag is within the Antenna's communications range. Measure the noise and take suitable noise countermeasures. Check the effect of surrounding metal and make sure that the desired communications distance can be obtained.
Bit 1 Flashing red	Error End + ID Tag Communications Error	ID Tag was detected in trigger mode but communications could not be ended normally.	Change the control timing so that communications can be started while the ID Tag is within the Antenna's communications range. Measure the noise and take suitable noise countermeasures. Check the effect of surrounding metal and make sure that the desired communications distance can be obtained.
Bit 2 Flashing red	Error End + Address Error	The command specified a memory area outside the ID Tag memory range.	Set the command memory area within the ID Tag memory range.
Bit 3 Flashing red	Error End + Protection Error	The command specified data to be written to the write-protected area of ID Tag.	Set the command memory area to outside the write-protected area.
Bit 4 Flashing red	Error End + Mismatch Error	Data was not correctly written to ID Tag.	Retry the writing process. If the error persists, replace the ID Tag.
Bit 5 Flashing red	Error End + ID System Error 1	ID Tag used is not supported by the FL Remote ID.	Change the ID Tag to one supported by the FL Remote ID.
Bit 6 Flashing red	Error End + ID System Error 2		
Bit 7 Flashing red	Normal End + ID Tag Service Life Warning	The number of ID Tag overwrites exceeded the maximum number of overwrites.	Replace the ID Tag that had the ID Tag service life warning.

LED	Output bit	Error	Corrective action
Bit 0 and bit 4 Flashing red	Error End + Command Error	There is an error with the execution command, or the command cannot not be received.	Check the command, address, and number of bytes to process.
Bit 7 to bit 0 Flashing red	Error End + Switch Error	Mode switch setting error	Set the mode switch correctly.
Bit 7 to bit 0 Lit red	Error End + System Error	The FL Remote ID cannot operate.	If the error continues after resetting the power, replace the FL Remote ID.

Errors and Countermeasures

The four main causes of problems that may occur in the FL Remote ID are as follows:

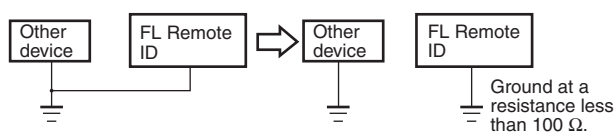
- Noise interference Take adequate countermeasures against noise.
 - External device failure
 - FL Remote ID failure
 - Others
- } Repairs are required.

■ Noise Interference

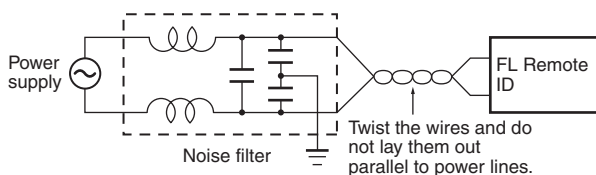
If the system malfunctions due to noise, refer to the following table and take appropriate countermeasures.

No.	Occurrence of fault	Possible cause	Countermeasure
1	Occurs when a heavy-duty motor, transformer, or capacitor is turned ON.	An instantaneous voltage drop due to inrush current to the heavy load.	Increase the capacity of the power supply and the size of the power cable.
		Common mode noise as a result of the above cause.	• Provide the power through a 1-to-1 non-grounded insulating transformer. • Do not use the same ground as other large-capacity devices. Independently ground the Controller at a resistance of 100 Ω or less. (See figure1.)
2	Occurs irregularly.	Noise on power line	Provide the power through a 1-to-1 non-grounded insulating transformer or noise filter. (See figure 2.)
3	Malfunction such as input signal turning ON when it should be OFF.	Inductive noise on input line	• Separate input signal from power lines. • If there is a lot of noise interference, put the input line inside a grounded metal conduit or use shielded cable.

1. Improvement in Grounding



2. Countermeasures Against Noise on Power Line



Maintenance and Inspection

The FL Remote ID must be inspected on a daily or regular basis so that the functions can be used in good condition. The FL Remote ID consists of semiconductors that last almost indefinitely. The following malfunctions may, however, result due to the operating environment and conditions.

- (1) Element deterioration due to overvoltage or overcurrent.
- (2) Element deterioration due to continuous stress caused by high ambient temperature.
- (3) Connector contact faults or insulation deterioration due to humidity and dust.
- (4) Connector contact faults or element corrosion due to corrosive gas.

■ Inspection Items

No.	Item	Detail	Criteria	Required equipment
1	Supply voltage fluctuation	(1) Check that the supply voltage fluctuation at the power supply terminal block is within the permissible range.	Within supply voltage specified range	Multimeter
		(2) Check that there are no frequent instantaneous power failures or radical voltage fluctuations.	Within permissible voltage fluctuation range	Power supply analyzer
2	Ambient environment			
	(a) Temperature	(a) Within the specified range	(a) -10 to 55°C	Maximum and minimum thermometer Hygrometer
	(b) Humidity	(b) Within the specified range	(b) 25% to 85%	
	(c) Vibration and shock	(c) Influence of vibration or impact of machines	(c) Within the specified range	
	(d) Dust	(d) Check that the system is free of accumulated dust and foreign particles.	(d) Neither is permitted.	
	(e) Corrosive gas	(e) Check that no metal part of the system is discolored or corroded.	(e) Neither is permitted.	
3	Panel condition			---
	(a) Ventilation	(a) Check that the system is ventilated properly with natural ventilation, forced ventilation, or cooling air.	(a) The interior temperature must be within a range between -10 and 55°C with proper ventilation.	
	(b) Damage to packing for any enclosed construction	(b) Check that the panel packing is properly attached with no damage.	(b) The packing must have no damage.	
4	I/O power supply (a) Voltage fluctuation (b) Ripple	Check on the I/O terminal block that the voltage fluctuation and ripple are within the permissible ranges.	Within the specified range	Multimeter Oscilloscope
5	Mounting condition	(1) Check that each device is securely mounted.	No loose screws	---
		(2) Check that each connector is fully inserted.	Each connector must be locked or securely tightened with screws.	---
		(3) Check that no screw of the terminal block is loose.	No loose screws	---
		(4) Check that no wire is broken or nearly broken.	Must be no wire that is broken or nearly broken.	---
		(5) Check that the distance between the ID Tag and Antenna is within the specified range.	Within the specified range	---
6	Tag life	Use the ID Tag service life warning function and manage the number of times the ID Tag has been written.	Do not allow the specified maximum number of overwrites to be exceeded.	---

MEMO

SECTION 7

Appendices

☒ Specifications and Dimensions	70
☒ Characteristics According to Operating Conditions	76
☒ Tag Memory Map	78
☒ Tag Memory Capacity and Memory Type	79
☒ Degree of Protection	80

Specifications and Dimensions

General Specifications

■ FL Remote ID: V680-HAM42-FRT

Item	Specifications
Supply voltage (power consumption)	24 VDC +10%/–15% (6 W max)
Ambient operating temperature	–10 to 55°C (with no icing)
Ambient operating humidity	25% to 85% (with no condensation)
Ambient storage temperature	–25 to 65°C (with no icing)
Ambient storage humidity	25% to 85% (with no condensation)
Insulation resistance	20 MΩ min. (at 500 VDC) between all terminals together (excluding ground terminals) and ground terminals and between all terminals together (excluding ground terminals) and the casing
Dielectric strength	1000 VAC (50/60 Hz) for 1 minute between all power supply terminals together (excluding ground terminals) and the casing
	500 VAC (50/60 Hz) for 1 minute between all terminals together (excluding ground terminals) and the casing
Vibration resistance	10 to 150 Hz, 0.2-mm double amplitude at 15 m/s ² in X, Y, and Z directions ten sweeps each for 8 minutes
Shock resistance	150 m/s ² in X, Y, and Z directions 3 times each (18 times in total)
Dimensions	65 × 65 × 65 (W × H × D) mm (excluding protruding parts)
Degree of protection	Panel-mounting (conforms to IP20)
Material	PC/ABS resin
Weight	Approx. 150 g
Mounting method	DIN Track

■ Antenna: V680-HS63-SP

Item	Specifications
Ambient operating temperature	–10 to 60°C (with no icing)
Ambient operating humidity	35% to 95% (with no condensation)
Ambient storage temperature	–25 to 75°C (with no icing)
Ambient storage humidity	35% to 95% (with no condensation)
Insulation resistance	20 MΩ min. (at 500 VDC) between power supply terminals and casing
Dielectric strength	1,000 VAC, 50/60Hz for 1 min between cable terminals and case
Vibration resistance	10 to 500 Hz, 1.5-mm double amplitude at 100 m/s ² in X, Y, and Z directions ten sweeps each for 11 minutes
Shock resistance	500 m/s ² , 3 times each in 6 directions (Total: 18 times)
Dimensions	40 × 53 × 23 (W × H × D) mm (excluding protruding parts)
Degree of protection	IP67 (excluding connector section)
Material	Case: Fluororesin (PTFE) Fill resin: Epoxy resin Cable: Fluororesin (FEP)
Cable length	10 m
Weight	Approx. 270 g
Mounting method	Two M4 screws

■ ID Tag: V680-D1KP66T-SP

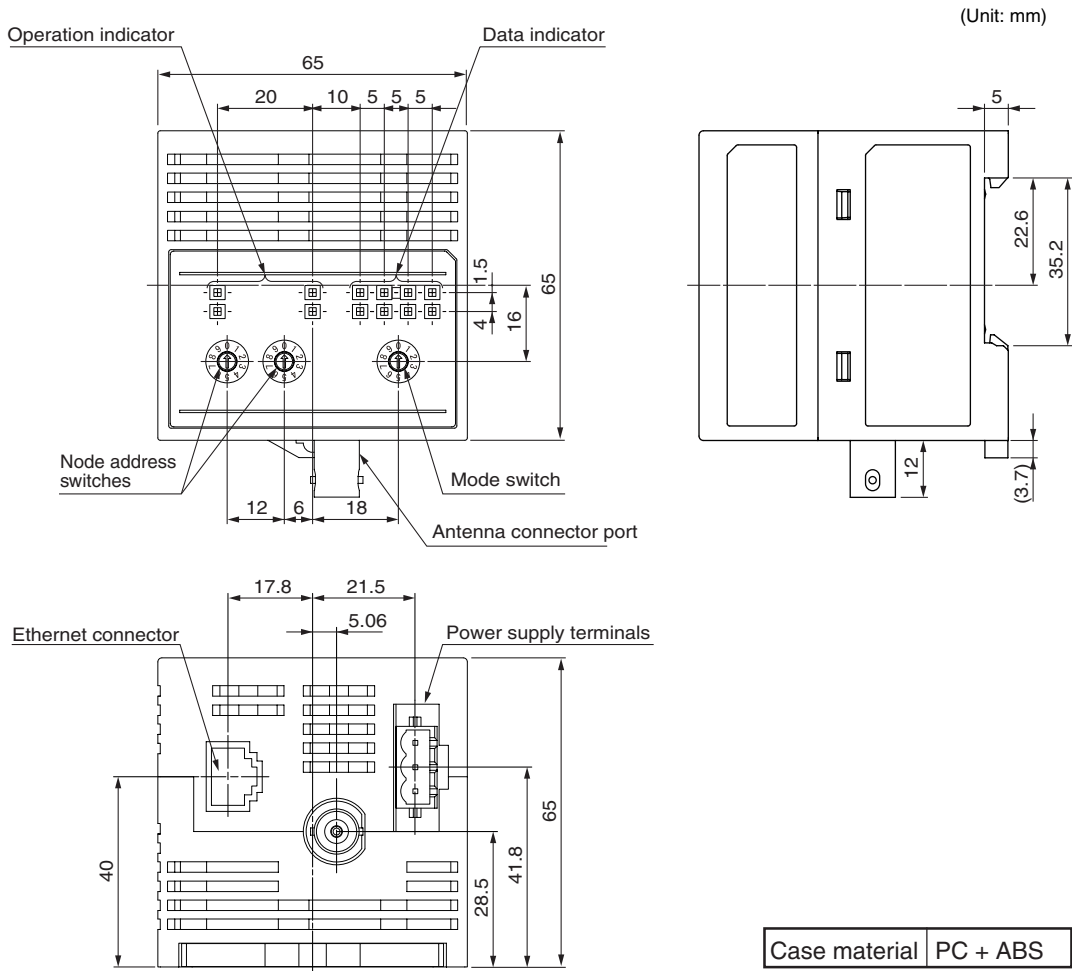
Item	Specifications
Memory capacity	1,000 bytes
Memory type	EEPROM
Data backup time	10 years after writing (85°C or less)
Memory longevity	100,000 times per block (25°C)
Ambient operating temperature	When communicating: –25 to 70°C (with no icing) When not communicating: –40 to 110°C (with no icing)
Ambient operating humidity	35% to 95% (with no condensation)
Ambient storage temperature	–40 to 110°C (with no icing)
Ambient storage humidity	35% to 95% (with no condensation)
Vibration resistance	10 to 2,000 Hz, 1.5-mm double amplitude at 150 m/s ² in X, Y, and Z directions ten sweeps each for 15 minutes
Shock resistance	500 m/s ² , 3 times each in 6 directions (Total: 18 times)
Dimensions	95 × 36.5 × 6.5 (W × H × D) mm (excluding protruding parts)
Degree of protection	IP67
Material	External coating: Fluororesin (PFA) Tag body: PPS resin
Weight	Approx. 20 g
Mounting method	Two M5 screws

Communications Specifications

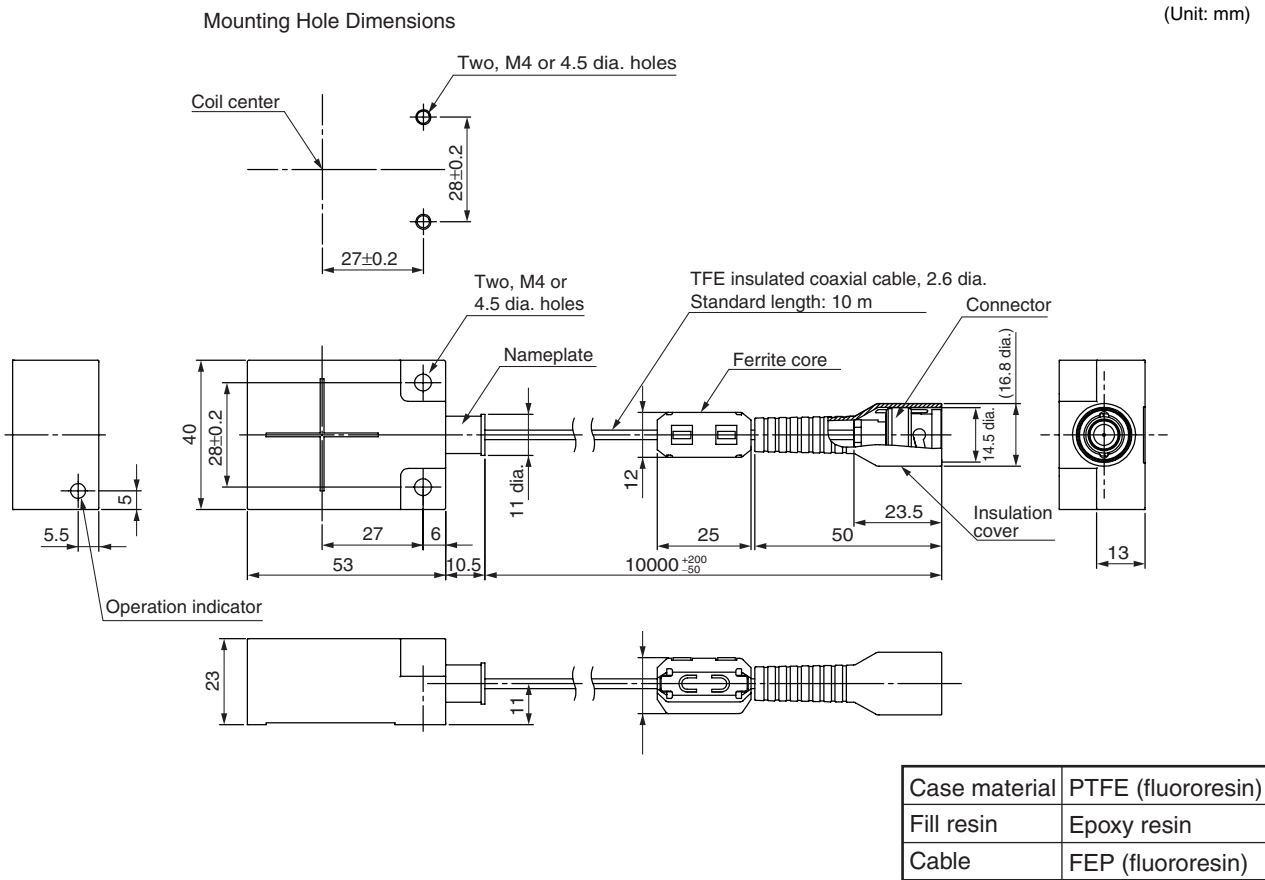
Item	Specifications
Communications protocol	FL-net Remote
Baud rate	Automatic switching between 10 Mbps/100 Mbps
Communications medium	FL-net Cable
Communications distance	Node to HUB 100 m max. HUB to HUB 100 m max. Node to node (one to one connection) 100 m max. Maximum extendable distance 200 m max. Note: The node may be either a Master or Slave.
Connection method	Switching hub
Node address	01 to 64 (select with switches)

Dimensions

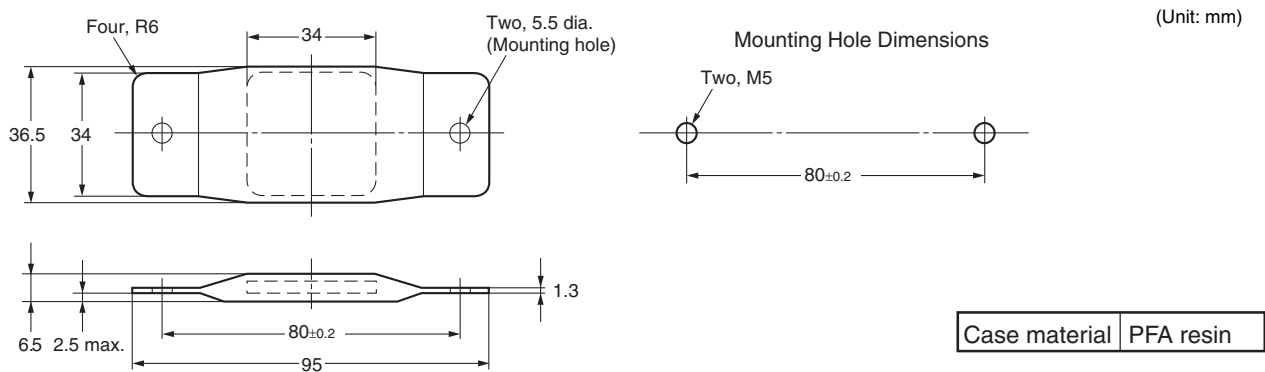
■ FL Remote ID: V680-HAM42-FRT



Antenna: V680-HS63-SP



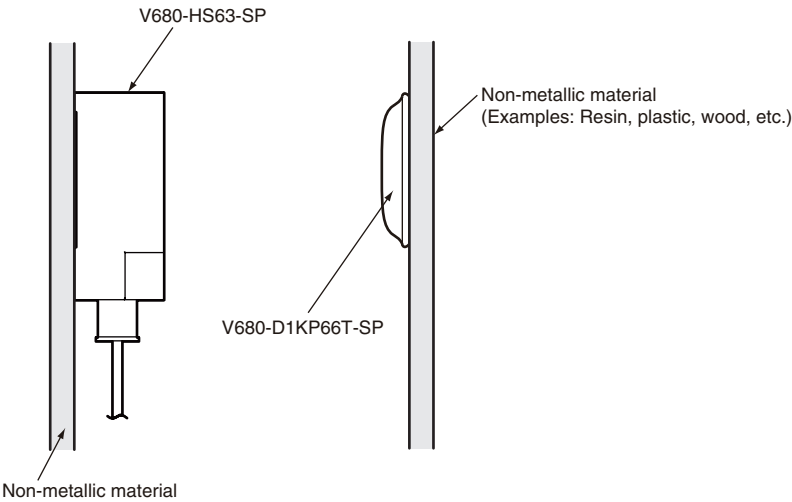
ID Tag: V680-D1KP66T-SP



Communications Distance Specifications
(Certified Performance)

Antenna	ID Tag	Communications distance	
V680-HS63-SP	V680-D1KP66T-SP	Read	0 to 30 mm (Axis offset: ± 10)
		Write	0 to 25 mm (Axis offset: ± 10)

Measurement Conditions

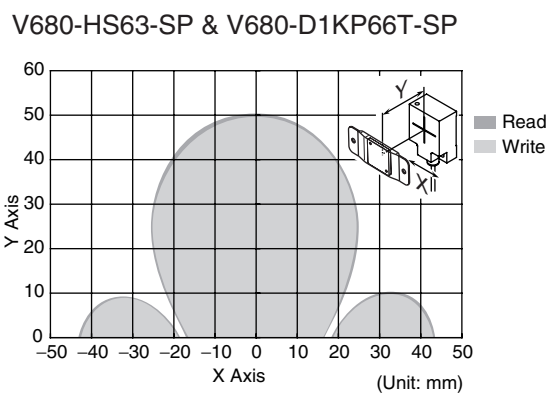


Characteristics According to Operating Conditions

Communications Area (Reference)

The following diagram shows the communications area for the V680 Series. The communications area depends on the installation conditions and environmental conditions.

The following diagram shows the communications area when a Tag passes by and perpendicular to the center of the Antenna. The Antenna and Tag surfaces are parallel to each other.



Communications Time (Reference)

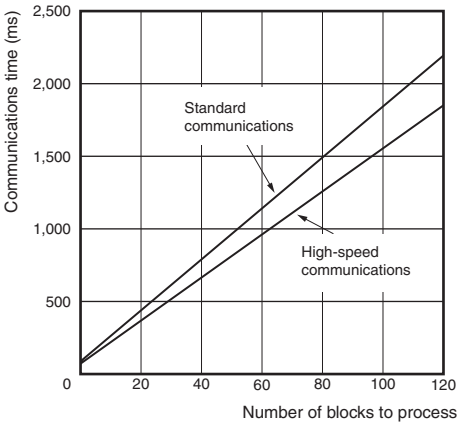
Command	Communications time (ms)
READ	29.2
WRITE	105.2
DATA FILL normal mode	$17.5 \times \text{No. of processing blocks} + 88.0$
DATA FILL high-speed mode	$14.8 \times \text{No. of processing blocks} + 70.8$



Processing blocks refer to the 8-byte memory areas expressed by Tag addresses $\square\square\square 0$ to $\square\square\square 7$ hex and $\square\square\square 8$ to $\square\square\square F$ hex.

CHECK!

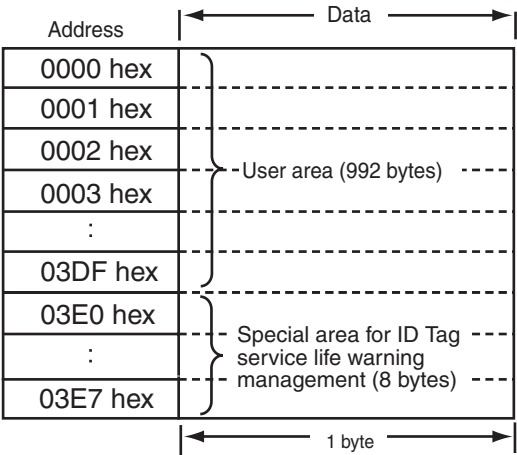
DATA FILL Communications Time Graph



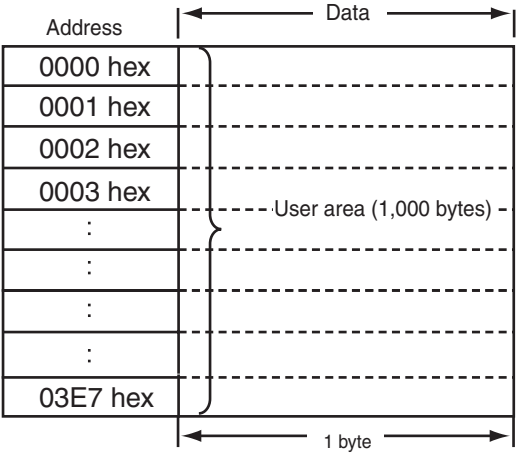
Tag Memory Map

The memory capacity of the V680-D1KP66T-SP ID Tag is 1 Kbyte.
Each address contains 1 byte of data.

■ ID Tag Service Life Warning
Function Enabled



■ ID Tag Service Life Warning
Function Disabled



0000 to 0007 hex and 0008 to 000F hex constitute one block.

CHECK!

Tag Memory Capacity and Memory Type

(As of June 2007)

Model	Memory capacity (user memory)	Memory type	Life expectancy
V680-D1KP66T-SP	1,000 bytes*	EEPROM	• Rewrite cycles: 100,000 cycles for each block (25°C) • Data backup: 10 years (at 85°C max.)

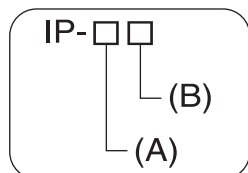
* The memory capacity will be 992 if the ID Tag service life warning management function is used.

Degree of Protection

Ingress protection degrees (IP-□□) are determined by the following tests. Be sure to check the sealing capability under the actual operating environment and conditions before actual use.

■ IEC (International Electrotechnical Commission) Standards

IEC 60529: 2001

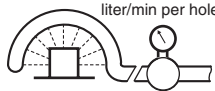
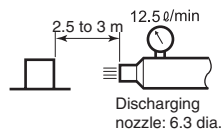
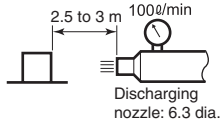
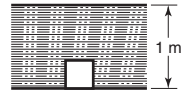


(A) First Digit: Degree of Protection from Solid Materials

Degree		Protection
0		No protection
1		Protects against penetration of any solid object such as a hand that is 50 mm or more in diameter.
2		Protects against penetration of any solid object, such as a finger, that is 12.5 mm or more in diameter. Even if finger or other object 12 mm in diameter penetrates, it will not reach a hazardous part.
3		Protects against penetration of any solid object, such as a wire, that is 2.5 mm or more in diameter.
4		Protects against penetration of any solid object, such as a wire, that is 1 mm or more in diameter.
5		Protects against penetration of dust of a quantity that may cause malfunction or obstruct the safe operation of the product.
6		Protects against penetration of all dust.

(B) Second Digit: Degree of Protection Against Water

Degree	Protection	Test method (with pure water)
0	No protection	Not protected against water. No test
1	Protection against water drops 	Protects against vertical drops of water towards the product. Water is dropped vertically towards the product from the test machine for 10 min.
2	Protection against water drop 	Protects against drops of water approaching at a maximum angle of 15° to the left, right, back, and front from vertical towards the product. Water is dropped for 2.5 min each (i.e., 10 min in total) towards the product inclined 15° to the left, right, back, and front from the test machine.
3	Protection against sprinkled water 	Protects against sprinkled water approaching at a maximum angle of 60° from vertical towards the product. Water is sprinkled for 10 min at a maximum angle of 60° to the left and right from vertical from the test machine.

Degree	Protection	Test method (with pure water)
4	Protection against water spray 	Protects against water spray approaching at any angle towards the product. Water is sprayed at any angle towards the product for 10 min from the test machine. 
5	Protection against water jet spray 	Protects against water jet spray approaching at any angle towards the product. Water is jet sprayed at any angle towards the product for 1 min per square meter for at least 3 min in total from the test machine. 
6	Protection against high pressure water jet spray 	Protects against high-pressure water jet spray approaching at any angle towards the product. Water is jet sprayed at any angle towards the product for 1 min per square meter for at least 3 min in total from the test machine. 
7	Protection underwater 	Resists the penetration of water when the product is placed underwater at specified pressure for a specified time. The product is placed 1 m deep in water (if the product is 850 mm max. in height) for 30 min. 
8	Protection underwater 	Can be used continuously underwater. The test method is determined by the manufacturer and user.

Revision History

A manual revision code appears as a suffix to the catalog number at the bottom of the front and rear pages.

Cat. No. Z268-E1-02

↑
Revision code

Revision code	Date	Revised contents
01	September 2007	Original production
02	September 2008	Added information on international standards and conforming standards. Changed output signal names for V680-HAM42-FRT and dielectric strength specifications. Added information on ID Tag service life warning management. Made other minor revisions.

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